

1044b UIC - EAST POPLAR OIL FIELD
ENFORCEMENT CASE SDWA 1431
Folder ID: 13676 1964 Privileged

Release in Fall

Region 8



13676

HISTORY



PRODUCTION DEPT
FILE COPY

EAST POPLAR UNIT WELL NO. 74

ROOSEVELT COUNTY, MONTANA

MURPHY CORPORATION--OPERATOR

EAST POPLAR UNIT WELL NO. 74

ROOSEVELT COUNTY, MONTANA

MURPHY CORPORATION--OPERATOR

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=====

W E L L H I S T O R Y

=====

RECEIVED

AUG 23 1956

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA

WELL NO.: East Poplar Unit No. 74

LOCATION: SE SW Section 13, Township 28 North, Range 51 East

ELEVATION: 2160' Ground - 2173' K.B.

CONTRACTOR: Zach Brooks Drilling Company

SPOUDED: 4:00 P.M., April 10, 1956

COMPLETED: May 12, 1956

TOTAL DEPTH: 5930' Driller equals 5930' Schlumberger

CASING: 9-5/8" @ 1038.90' with 400 sacks cement
5-1/2" @ 5933.00' with 300 sacks cement

TUBING: 2-3/8" @ 5597.59'

PERFORATIONS: "B-1" Zone - 5740' - 5748' (plugged)
"A" Zone - 5597' - 5604'

PACKER: Baker Model "DA" production packer @ 5720'
Baker Model "DA" production packer @ 5578'

ACID TREATMENT: "B-1" Zone - 500 gallons etching acid (plugged)
"A" Zone - 1000 gallons etching acid

INITIAL POTENTIAL: Pumped 333 BFPD, 87% BS&W (43 EOPD, 290 BWPD), test
made July 20, 1956

TYPE COMPLETION: Single completion from the "A" Zone

FILE E.P.U. 117

Copy - FILE
MIT Jones -

To L.H. Duncan

EAST POPLAR UNIT NO. 74

East Poplar Field
Roosevelt County, Montana

HISTORY: Completed May 12, 1956 from the A-3 Zone perforations 5597-5604'. The B-1 Zone 5740-48' swab tested 7 BFPH, salt water with trace of oil. Squeezed. Cumulative Production A-3 Zone 55,708 BO. 946,746 BW A-1 Zone 6,041 BO 19,562 BW through April, 1967.

Workover No. 1: January, 1964 Squeezed the A-3 Zone perforations 5597-5604' with Latex Cement. Sand Notched the A-1 Zone at 5567' and 5569' with salt water, 7-1/2% Acid and Sand.

Workover No. 2: August, 1964 Production declined to 5 BOPD 10 BWPD. Acidized the A-1 Zone with 3000 gallons HOWCO CRA-10 Acid. Workover Potential 15 BOPD 20 BWPD.

PRESENT STATUS: Pumped 7 days in April. Produced 27 BO Average 4 BOPD (uneconomical).

ESTIMATED VALUE OF EQUIPMENT

160 Peak Torque American Pumping Unit	\$ 1,850.00
30 HP Electric Motor and Controls	\$ 300.00
5562' of 2-7/8" and 2-3/8" Tubing and 5500' of 5/8", 3/4", and 7/8" Rods	\$ 2,950.00
Pulling Unit 10 hrs. at \$33.00	(\$ 350.00)
Tuboscope Tubing and Rods	(\$ 1,000.00)
Misc. Labor and Trucking	(\$ 450.00)
Estimated Net Salvage Value of Equipment	\$ 3,300.00

(Pay out for equipment with 27 BOPM 611 months No pay out)

RECOMMENDATION: Temporarily abandon and salvage equipment.

Ague

SL

5/11/67

MIT Jones

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EAST POPLAR UNIT NO. 74
SE SW Section 13-T28N-R5E, Roosevelt County, Montana

Pumping unit complete with engine	\$5,650
Labor and materials setting unit	750
Trucking, small fittings, and incidentals	150
Rods, pump, and well head equipment	3,000
Testing with portable unit prior to permanent installation	<u>500</u>

TOTAL ESTIMATED COST

\$10,050

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Corporation	31.448470	\$3,161
Muneco Company	2.096565	211
Placid Oil Company	33.545035	3,371
The Carter Oil Company	16.335860	1,642
Phillips Petroleum Company	16.335860	1,642
C. F. Lundgren	.238210	24

APPROVAL OF EXPENDITURE

Requested by:

Recommend Approval:

Handwritten signature JUL 25 1956
 Division Production Supt. Date

Staff Production Man Date

Recommend Approval:

Recommend Approval:

Handwritten signature JUL 25 1956
Out Division Manager Date

Budget Supervisor Date

Approved:

Vice President-Operations Date

H1:eg
 7-25-56

File #77

A.F.E. NO. 57-5-3

~~A.F.E. No. 57-5-37~~
(Revised)

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EASTPOPLAR UNIT NO. 74 85
~~SE SW Section 13 T22N R54E, Roosevelt County, Montana~~
~~(Installation of Pumping Unit)~~

Pumping unit complete with engine
Labor and materials setting unit (Contract)
Trucking, small fittings, and incidentals *Dist. work*
Rods, pump, and well head equipment

~~\$5,000~~ 5650
700 950
200 300
~~2,000~~ 3000
~~10,000~~ 9900

TOTAL ESTIMATED COST

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Corporation	31.448470%	\$3,000	3,113
Munoco Company	2.098565%	200	208
Placid Oil Company	33.545035%	3,200	3,321
The Carter Oil Company	18.335860%	1,560	1,617
Phillips Petroleum Company	18.335860%	1,560	1,617
C. F. Lundgren	.238210%	23	24

APPROVAL OF EXPENDITURE

Requested by:

Harold Milan AUG 6 1958
Division Production Supt. Date

Recommend Approval:

Staff Production Man Date

Recommend Approval:

Ant J. D. Langford AUG 6 1956
Division Manager Date

Recommend Approval:

Budget Supervisor Date

Approved:

Vice President-Operations Date

C-20-10

*14 Plain
8 w/approval*

HM:eg
8-6-58

File

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EAST POPLAR UNIT NO. 74
SE Section 13-T28N-R51E, Roosevelt County, Montana

WELL DRILLING & CONSTRUCTION EXPENSE:	TO CSG. PT.	COMP. & EQUIP.	TOTAL COST
Drilling - Footage - 5965' @ \$5.25/ft.	\$ 31,315		\$ 31,315
Daywork - 5 days @ \$850/day	4,250		4,250
2 days @ \$775/day		\$ 1,550	1,550
Loc. survey, permit & prep.	500		500
Roads, fences, cattle guard, etc.	600		600
Mud mat. & chem., incl. oil & gas	4,000		4,000
Cementing casing	1,500	1,250	2,750
Coring materials & services	1,000		1,000
Testing services incl. swabbing	1,500	300	1,800
Other logs, surveys & analysis	1,200	800	2,000
Perforating services		600	600
Hydrafrac, acidize, etc., incl. oil		1,400	1,400
Float equip., centralizers, etc.	250	650	900
Trucking, welding & other labor	500	500	1,000
Supervision & miscellaneous	250	250	500
Total Est. Well Drilling & Const. Exp.	\$ 46,865	\$ 7,300	\$ 54,165
WELL EQUIPMENT COSTS:			
Casing: 1000' of 9-5/8" O.D.	\$ 3,750		\$ 3,750
Casing: 5965' of 5-1/2" O.D.		\$ 9,950	\$ 9,950
Tubing: 5965' of 2-7/8" O.D.		4,950	4,950
Casing head & connections	300		300
Xmas tree & connections		800	800
Total Est. Well Equip. Costs	\$ 4,050	\$ 15,700	\$ 19,750
Total Est. Cost of Well	\$ 50,915	\$ 23,000	\$ 73,915
LEASE EQUIPMENT:			
Flow lines		\$ 3,500	\$ 3,500
Other line pipe, valves & fittings		500	500
Trucking, welding & other labor		500	500
Total Est. Cost of Lease Equip.		\$ 4,500	\$ 4,500
TOTAL EST. COST OF WELL & LEASE EQUIP.	\$ 50,915	\$ 27,500	\$ 78,415

APPORTIONMENT OF TOTAL ESTIMATED COSTS

Murphy Corporation -	%			
Unit Operator	31.448470	\$ 16,012	\$ 8,648	\$ 24,660
Munoco Company	2.096565	1,067	577	1,644
Placid Oil Company	33.545035	17,079	9,225	26,304
The Carter Oil Company	16.335860	8,317	4,492	12,810
Phillips Petroleum Company	16.335860	8,317	4,492	12,810
C. F. Lundgren	.238210	121	66	187

APPROVAL OF EXPENDITURE

Requested by:

Harold Milo MAR 28 1956
Division Production Supt. Date

Recommend Approval:

London Kirby MAR 28 1956
Division Manager Date

Approved:

By _____ Date _____

Recommend Approval:

Staff Production Engineer Date

Recommend Approval:

Budget Supervisor Date

Approved:

Vice President-Operations Date

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EAST POPLAR UNIT NO. 74
SE SW Section 13, T28N, R51E, Roosevelt County, Montana

HISTORY: The B-1 Zone was perforated 5740-48', swab tested salt water with trace of oil. The B-1 Zone was squeezed off. Completed May 12, 1956 from the A-3 Zone perforations 5597-5604'. Initial potential - 333 BFPD, 87% water. Cumulative production through September 1963 - 55,044 barrels oil, 710,531 barrels water.

PRESENT STATUS: Pumping from the A-3 Zone at the rate of 8 barrels oil per day and 390 barrels water per day. (uneconomical)

JUSTIFICATION: Oil production from the A-3 Zone has declined to the economical limits due to high water cut (98%) and it is doubtful that workover of the present zone would be successful. Estimated production from A-1 Zone (based on EPU #80 A-1 & 2 Zone) 50-60 BOPD with 30-75% water cut. Estimated payout 60-90 days if successful.

PROPOSAL: Squeeze the A-3 Zone perforation 5597-5604' with latex cement through Model "DA" Production Packer at 5578'. Sand notch the A-1 Zone 5568' and 5569' with 7.5% acid for sand carrying agent to clean and open the A-1 formation. Reverse out sand and acid. ~~Squeeze~~ pump test.

ESTIMATED COST

Pulling unit 40 hours at \$30 per hour	\$1,200
Pump truck and 40 sacks latex	\$1,000
To perforate the A-1 Zone with sand notch at 5566 & 5568	\$1,500
Misc. labor, trucking and material	\$ 400
TOTAL ESTIMATED COST	\$4,100

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Corporation	31.448470%	\$1,289
Munoco Company	2.096565%	\$ 86
Placid Oil Company	33.545035%	\$1,373
Humble Oil & Refining Company	16.335860%	\$ 670
Phillips Petroleum Company	16.335860%	\$ 670
C. F. Lundgren	.238210%	\$ 10

APPROVAL OF EXPENDITURE

Requested By: M. T. James 10-23-63 Recommend Approval:
M. T. James Date

L. L. Duncan Date W. J. Thornton Date

APPROVED:

BL RGS 12-10-63
Manager - P. & E. Date

MTJ/bab
10-23-63

AUTHORITY FOR EXPENDITURE
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 74
SE SW Section 13, T28N, R51E, Roosevelt County, Montana

(SUPPLEMENT #1)

JUSTIFICATION:

EPU #74, Workover #1, Supplement #1 to A.F.E. #3-1528 is to cover the additional expense due to 500 gallons acid job not anticipated and the additional cost of sucker rods to lower pumping depth to PBTD.

TOTAL ADDITIONAL EXPENSE

Pulling Unit 20 hours at \$30 per hour	\$ 600
500 gal. acid and service	\$ 625
2150' of 5/8 and 3/4" sucker rods Class #1	\$1,325
Misc. labor, trucking and material	\$ 400
ESTIMATED COST	\$2,950

APPORTIONMENT OF TOTAL ADDITIONAL EXPENSE

Murphy Corporation	31.448470%	\$ 927
Munoco Company	2.096565%	\$ 62
Placid Oil Company	33.545035%	\$ 990
Humble Oil & Refining Company	16.335860%	\$ 482
Phillips Petroleum Company	16.335860%	\$ 482
C. F. Lundgren	.238210%	\$ 7

APPROVAL OF EXPENDITURE

Requested By: M. T. James

M. T. James

1-20-64
Date

Approved
Recommended Approval:

L. L. Duncan

1-23-64
Date

W. J. Thornton

1-28-64
Date

APPROVED:

Y
Manager - P. & E.

Date



GENERAL RULES

201, 202, 213,
216, 219, 213.1

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

APR 27 1956

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	X
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

April 26, 1956

Following is a ~~Notice of Intention to do work~~ report of work done on land ~~owned~~ leased described as follows:

LEASE E.P.U. Fee-0! Connor (6011)

MONTANA
(State)Roosevelt
(County)East Poplar
(Field)Well No. 74 SE SW Section 13 28N 51E M.P.M.
(m. sec.) (Township) (Range) (Meridian)The well is located 658 ft. from ~~XX~~ S southline and 1984 ft. from ~~XX~~ W west line of Sec. 13

(Locate accurately on Plat on back of this form the well location, and show lease boundary.)

The elevation of the derrick floor above the sea level is 2172' K.B.

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Spudded at 4:00 P.M., 4-10-56. Ran 27 jts. (1028.15') of 9-5/8", 36#, J-55, 8rd. thd., ST&C, R-3, American casing. Landed 10.75' below RKB at 1038.90'. Howco guide shoe on bottom and one Howco centralizer at 1024'. Reciprocated casing 15' for 1 hour while circulating and cementing. Cemented with 400 sacks of regular cement with 2 percent CaCl₂. Circulated approximately 50 sacks of clean cement to surface. Bumped plug with 800# PSI, checked plug with Halliburton at 1000# PSI, released pressure, float valve held ok.

Approved *U. S. S. 4-27-56*
Approved subject to conditions on reverse of formDate *4/18/56*By *John R. L. S. S.*

District Office Agent

Company MURPHY CORPORATION

By *Harold Milan*

Title Division Production Superintendent

Address 602 Midland Bank Bldg, Billings, Mont.

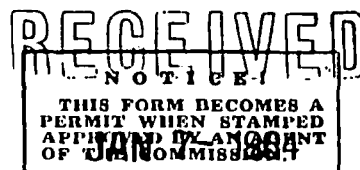
NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY



OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
Notice of Intention to Workover	xx		

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

January 2, 1964

Following is a { notice of intention to do work } on land { ~~XXXXXX~~ } described as follows:
~~report of work done~~ leased

LEASE O'Connor

MONTANA (State) Roosevelt (County) East Poplar (Field)

Well No. 74 SE SW Section 13 28N 51E MPM
(m. sec.) (Township) (Range) (Meridian)

The well is located 658 ft. from { S } line and 1984 ft. from { W } line of Sec. 13

(Locate accurately on Plat on back of this form the well location, and show lease boundary.)

The elevation of the derrick floor above the sea level is 2160Gr.

RECEIVED

READ CAREFULLY

DETAILS OF PLAN OF WORK

JAN 3 - 1964 CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing, etc.)

DETAILS OF WORK
RESULT

Squeeze the A Zone perforation 5597-5604' with latex cement through Model "DA" Production Packer at 5578'. Sand notch the A Zone 5567' and 5569' with 7.5% acid for sand carrying agent to clean and open the A Formation. Reverse out sand and acid. Pump test.

Approved subject to conditions on reverse of form

Date 1-3-64
By John R. King
Title District Office Agent

Company Murphy Oil Corporation
By M. L. James
Title Field Production Superintendent
Address P.O. Box 547, Poplar, Montana 59255

NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL

OVER

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TRIPLICATE
(Other instructions on reverse side)Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>	<div>U. S. GEOLOGICAL SURVEY RECEIVED JAN 3 1964 BILLINGS, MONTANA</div>	5. LEASE DESIGNATION AND SERIAL NO.
2. NAME OF OPERATOR Murphy Oil Corporation		6. IF INDIAN, ALLOTTEE OR TRIBE NAME O'Connor
3. ADDRESS OF OPERATOR Poplar, Montana 59255		7. UNIT AGREEMENT NAME East Poplar
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 658' from S line and 1984' from W line of Section 13		8. FARM OR LEASE NAME East Poplar Field
14. PERMIT NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.) 2160 Gr.	9. WELL NO. EPD 974
		10. FIELD AND POOL, OR WILDCAT East Poplar Field
		11. SEC. T., R., M., OR BLK. AND SURVEY OR AREA SE 34 Section 13, T28N, R51E, NPM
		12. COUNTY OR PARISH Rockyvale
		13. STATE Montana

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>	(Other) <input type="checkbox"/>
(Other) <input type="checkbox"/>	Workover <input checked="" type="checkbox"/>	(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Squeeze the A Zone perforation 5597-5604' with latex cement through Model "BA" Production Packer at 5578'. Sand notch the A Zone 5567' and 5569' with 7.5% acid for sand carrying agent to clean and open the A Formation. Reverse out sand and acid. Pump test.

18. I hereby certify that the foregoing is true and correct

ORIGINAL SIGNED BY M. T. JAMES
SIGNED

TITLE **Field Production Superintendent** DATE **January 2, 1964**

(This space for Federal or State office use)

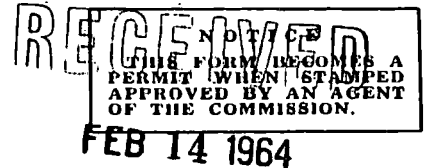
APPROVED BY **(LONG, SOD.) HILLARY A. ODEN**
CONDITIONS OF APPROVAL, IF ANY:

TITLE **DISTRICT ENGINEER**

DATE

JAN 3 1964

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

SUNDRY NOTICES AND REPORT OF WELLS

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		Report of Workover	XX

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

February 11, 1964

Following is a ~~REPORT OF WORK DONE~~ on land ~~LEASED~~ described as follows:

LEASE O'Connor

MONTANA
(State)Roosevelt
(County)East Poplar
(Field)Well No. 74 SE SW Section 13 28N 51E MPM
(m. sec.) (Township) (Range) (Meridian)

The well is located 658 ft. from S line and 1984 ft. from W line of Sec. 13

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is 2160 Gr.

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

See Attached Workover Sheet

RECEIVED

FEB 13 1964

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGS

Approved subject to conditions on reverse of form

Date Feb. 13, 1964

By Bill B. Lane, Chief Title

District Office Agent

Company Murphy Oil Corporation

By M. J. James

Title Field Production Superintendent

Address P.O. Box 547, Poplar, Montana 59255

NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL

OVER

1

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TR
(Other instruct.
verse side)CATE*
on re-Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>	U. S. GEOLOGICAL SURVEY	7. UNIT AGREEMENT NAME	O'Connor
2. NAME OF OPERATOR	RECEIVED	8. FARM OR LEASE NAME	East Poplar
3. ADDRESS OF OPERATOR	FEB 12 1964	9. WELL NO.	RPU #74
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface	BILLINGS, MONTANA	10. FIELD AND POOL, OR WILDCAT	East Poplar Field
658' from S line and 1984' from W line of Section 13		11. SEC. T. R. S. M. OR BLK. AND SURVEY OR AREA	SE SW Section 13, T28N, R51E, MPM
14. PERMIT NO.	15. ELEVATIONS (Show whether DP, RT, GR, etc.)	12. COUNTY OR PARISH	Roosevelt
	2160 Gr.	13. STATE	Montana

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENTS <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>	Workover <input checked="" type="checkbox"/>
(Other) <input type="checkbox"/>		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

See Attached Workover Sheet

18. I hereby certify that the foregoing is true and correct

ORIGINAL SIGNED BY M. T. JAMES
SIGNED

TITLE Field Production Superintendent DATE February 11, 1964

(This space for Federal or State office use)

APPROVED BY (ORIG. SGN.) HILLARY A. ODEN
CONDITIONS OF APPROVAL, IF ANY:

TITLE DISTRICT ENGINEER

DATE FEB 12 1964

*See Instructions on Reverse Side

ORIGINAL FORWARDED TO CASPER

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TRIP
(Other instructions
verse side)TE
re-Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.

O'Connor

6. IF INDIAN ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

East Poplar

8. FARM OR LEASE NAME

9. WELL NO.

EPU 474

10. FIELD AND POOL, OR WILDCAT

East Poplar Unit

11. SEC. T., S., M., OR BLK. AND
SURVEY OR AREASE SW Section 13,
T28N. R51E. MPM

12. COUNTY OR PARISH

Roosevelt

13. STATE

Montana

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)1. OIL WELL ☒ GAS WELL ☐ OTHER ☐

2. NAME OF OPERATOR

Murphy Oil Corporation

3. ADDRESS OF OPERATOR

Poplar, Montana 59255

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*
See also space 17 below.)
At surface

658' from S lines and 1984' from W line of Section 13

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

2160 Gr.

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data.

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

FRACTURE TREAT

ACIDIZE

REPAIR WELL

(Other)

PULL OR ALTER CASING

MULTIPLE COMPLETE

ABANDON*

CHANGE PLANS

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

FRACTURE TREATMENT

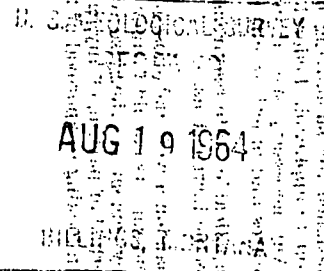
SHOOTING OR ACIDIZING

(Other)

REPAIRING WELL

ALTERING CASING

ABANDONMENT*

(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any
proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones perti-
nent to this work.)*Acidize the A Zone through retrievable packer with 3000 gallons of HOCO CRA-10
controlled reaction acid. Use lease crude for acid displacement fluid. Swab test.

18. I hereby certify that the foregoing is true and correct

ORIGINAL SIGNED BY M. T. JAMES

SIGNED

TITLE Field Production Superintendent DATE August 18, 1964

(This space for Federal or State office use)

(ORIG. SGD.) MICHAEL F. REITZ

APPROVED BY

CONDITIONS OF APPROVAL, IF ANY:

TITLE

ACTING DISTRICT ENGINEER

DATE

AUG 19 1964

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE!
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shut-off Acidize, Shut-off	<input checked="" type="checkbox"/>	Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 18, 1964

Following is a ~~Subsequent Report of Water Shut-off~~ on land ~~Shut-off~~ leased described as follows:

LEASE O'Connor

MONTANA (State) Roosevelt (County) East Poplar (Field)
Well No. 74 SE SW Section 13 28N 51E 13W
(m. sec.) (Township) (Range) (Meridian)

The well is located 650 ft. from { S } line and 1984 ft. from { W } line of Sec. 13

(Locate accurately on Plat on back of this form the well location, and show lease boundary.)

The elevation of the derrick floor above the sea level is 2160 ft.

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Acidize the A Zone through retrievable packer with 3000 gallons of HSCO CRA-10 controlled reaction acid. Use lease crude for acid displacement. AUG. EST. 1964

AUG 19 1964

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGS

Approved subject to conditions on reverse of form

AUG 19 1964

Date

By ORIGINAL COPY SIGNED

By: Gordon D. Lanouette Title

District Office Agent

Company Murphy Oil Corporation

By ORIGINAL SIGNED BY M. T. JAMES

Title Field Production Superintendent

Address P.O. Box 547, Poplar, Montana 59255

NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL

OVER

3-331
1963

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPPLICATE*
(Other instructions on re-
verse side)

Form approved.
Budget Bureau No. 42-R1424.

4. LEASE DESIGNATION AND SERIAL NO.

O'Connor

5. IF INDIAN, ALLOTTEE OR TRIBE NAME

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT--" for such proposals.)

1. OIL WELL ☒ GAS WELL ☐ OTHER ☐

2. NAME OF OPERATOR

Murphy Oil Corporation

3. ADDRESS OF OPERATOR

Poplar, Montana 59255

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*
See also space 17 below.)
At surface

658' from S lines and 1984' from W line of Section 13

14. PERMIT NO.

15. ELEVATIONS (Show whether DP, RT, GR, etc.)

2160 Gr.

7. UNIT AGREEMENT NAME

East Poplar

8. FARM OR LEASE NAME

9. WELL NO.

EPU #74

10. FIELD AND POOL, OR WILDCAT

East Poplar Unit

11. SEC., T., R., M., OR BLE. AND
SURVEY OR AREA

SE SW Section 13,
T28N, R51E, MPM

12. COUNTY OR PARISH

Roosevelt

13. STATE

Montana

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

FRACTURE TREAT

OR ACIDIZE

REPAIR WELL

(Other)

PULL OR ALTER CASING

MULTIPLE COMPLETE

ABANDON*

CHANGE PLANS

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

FRACTURE TREATMENT

SHOOTING OR ACIDIZING

(Other)

REPAIRING WELL

ALTERING CASING

ABANDONMENT*

(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Acidize the A Zone through retrievable packer with 3000 gallons of HOWCO CRA-10 controlled reaction acid. Use lease crude for acid displacement fluid. Swab test.

ORIGINAL FORWARDED TO CASPER

AUG 18 1964

18. I hereby certify that the foregoing is true and correct

SIGNED ORIGINAL SIGNED BY M. T. JAMES

TITLE Field Production Superintendent DATE August 18, 1964

(This space for Federal or State office use)

(ORIG. SGD.) MICHAEL F. REITZ

APPROVED BY
CONDITIONS OF APPROVAL, IF ANY:

TITLE ACTING DISTRICT ENGINEER

DATE AUG 18 1964

*See Instructions on Reverse Side

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting , Acidizing, Cementing	<input checked="" type="checkbox"/>
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 31, 1964

Following is a ~~report of work done~~ on land ~~leased~~ described as follows:

LEASE 9th Connor

MONTANA
(State)

Roosevelt
(County)

East Poplar Unit
(Field)

Well No. 74 SE SW Section 13 28N 51E NPM
(m. sec.) (Township) (Range) (Meridian)

The well is located 658 ft. from S line and 1984 ft. from W line of Sec. 13

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is 2160 Gr.

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

See Attached Sheet

RECEIVED

SEP - 1 1964

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGS

Approved subject to conditions on reverse of form

SEP - 1 1964

Date

ORIGINAL SIGNED BY:

By J. R. Hug, Supervisor

Title

District Office Agent

Company Murphy Oil Corporation

ORIGINAL SIGNED BY M. T. JAMES.

By

Title Field Production Superintendent

Address P.O. Box 347, Poplar, Montana 59235

NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL

OVER

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TRIPLI
(Other instructions
verse side)E*
re-Form approved.
Budget Bureau No. 42-R1424.

6. LEASE DESIGNATION AND SERIAL NO.

O'Connor

8. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

East Poplar

8. FARM OR LEASE NAME

9. WELL NO.

EPU #74

10. FIELD AND POOL, OR WILDCAT

East Poplar Unit

11. SEC., T., R., M., OR BLK. AND
SURVEY OR AREASE SW Section 13,
T28N, R51E, MPH

12. COUNTY OR PARISH 18. STATE

Roosevelt

Montana

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>	U. S. GEOLOGICAL SURVEY RECEIVED
2. NAME OF OPERATOR Murphy Oil Corporation	SEP 1 1964
3. ADDRESS OF OPERATOR Poplar, Montana 59255	BILLINGS, MONTANA
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 658' from S line and 1984' from W line of Section 13	
14. PERMIT NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.) 2160 Gr.

18. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐FRACTURE TREAT ☐SHOOT OR ACIDIZE ☐REPAIR WELL ☐(Other) ☐PULL OR ALTER CASING ☐MULTIPLE COMPLETE ☐ABANDON* ☐CHANGE PLANS ☐

SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐FRACTURE TREATMENT ☐ACIDIZING ☒(Other) ☐REPAIRING WELL ☐ALTERING CASING ☐ABANDONMENT* ☐(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

See Attached Sheet

18. I hereby certify that the foregoing is true and correct

ORIGINAL SIGNED BY M. T. JAMES
SIGNED

TITLE Field Production Superintendent August 31, 1964

(This space for Federal or State office use)

(ORIG. SGD.) HILLARY A. ODEN

DISTRICT ENGINEER

APPROVED BY

CONDITIONS OF APPROVAL, IF ANY:

TITLE

DATE SEP 3 1964

*See Instructions on Reverse Side

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE

THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
Temp. Abandon	XX		

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

May 17, 1967

Following is a notice of intention to do work on land leased described as follows:

LEASE O'Connor

MONTANA
(State)Roosevelt
(County)East Poplar Unit
(Field)Well No. 74 SE 8W Sec. 13 28N 31E 40M
(m. sec.) (Township) (Range) (Meridian)

The well is located 638 ft. from S line and 1984 ft. from W line of Sec. 13

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is 2160' G.L.

READ CAREFULLY

DETAILS OF PLAN OF WORK

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing)

RECEIVED
READ CAREFULLY

MAY 18 1967

DETAILS OF WORK
RESULTOIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGSWell pumped 7 days in April. Produced 27 BO Average of 4 BOPD -
Uneconomical. Tubing and rods will be pulled. Casing will be left
intact. Temporarily Abandon. 5-17-67

Approved subject to conditions on reverse of form

Date MAY 18 1967

ORIGINAL SIGNED BY:

By J. R. Hug, Supervisor

Title

District Office Agent

Company MURPHY OIL CORPORATION

By ORIGINAL SIGNED BY M. P. JAMES

Title Field Production Superintendent

Address P.O. Box 547, Poplar, Montana 59255

NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL

OVER

MCKEE PRINT.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN THE
(Other instruct.
verse side)CATE
on reForm approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT" for such proposals.)

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>	U. S. GEOLOGICAL SURVEY RECEIVED MAY 18 1967	0. CONNOR
2. NAME OF OPERATOR Murphy Oil Corporation		1. INDIAN, ALLOTTEE OR TRIBE NAME
3. ADDRESS OF OPERATOR P.O. Box 547, Poplar, Montana		2. AGREEMENT NAME
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface		3. NAME OF LEASE NAME
		4. WELL NO.
		5. FIELD AND POOL, OR WILDCAT
		6. SURVEY OR AREA
		7. SECTION 13, T14N, R51E, MPM
		8. COUNTY OR PARISH
		9. STATE
14. PERMIT NO.	15. ELEVATIONS (Show whether DF, BT, GR, etc.) 2160' G.L.	10. Roosevelt, Montana

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data			
NOTICE OF INTENTION TO:		SUBSEQUENT REPORT ON:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONING WELL <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>	(Other) <input type="checkbox"/>
(Other) Temp. Abandon	XX	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Well pumped 7 days in April. Produced 27 BO Average of 4 BO/D
Un economical. Tubing and rods will be pulled. Casing will be left
intact. Temporarily Abandon. 5-17-67

18. I hereby certify that the foregoing is true and correct

SIGNED ORIGINAL SIGNED BY M. T. JAMESTITLE Field Production Superintendent DATE May 17, 1967

(This space for Federal or State office use)

(ORIG. SGD.) HILARY A. OUL

APPROVED BY _____

TITLE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

TO

NOTICE
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment
Notice of Intention to Pull or Alter Casing		Supplementary Well History
Notice of Intention to Abandon Well	X	Report of Fracturing

July 27

19 **76**

LEASE East Poplar Unit

East Poplar Unit
(Field)

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is..... **2160' C.L.**

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK RESULT

It is proposed to plug and abandon this well as follows:

Set a bridge plug with wireline at 4700' with a 100' cement plug on top.
Cut 5-1/2" casing off at approximately 3600' and set a 50 sack cement plug at top of casing stub.
Set a 100' cement plug at the top of the Dakota Sand, 3213'.
Set a 100' cement plug (50' in and 50' out) at bottom of 9-5/8" surface casing.
Set a 10' cement plug at top of surface casing. The surface casing will be cut off 4' below ground level and a steel cap welded on top of the 9-5/8" casing.
No dry hole marker is to be erected.

Company **MURPHY OIL CORPORATION**

By.....ORIGINAL SIGNED BY
BILLY G. MELEAR.....

Title **District Superintendent**

Address P.O. Box 547, Poplar, Montana 59055

COMMISSION USE ONLY

API WELL NUMBER

2 5

STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

OVER

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TRIPLICATE*
(Other instructions on re-
verse side)Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>		5. LEASE DESIGNATION AND SERIAL NO. O'Connor	
2. NAME OF OPERATOR Murphy Oil Corporation		6. IF INDIAN, ALLOTTEE OR TRIBE NAME	
3. ADDRESS OF OPERATOR P.O. Box 547, Poplar, Montana 59255		7. UNIT AGREEMENT NAME	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 658' from South line and 1984' from West line of Section 13		8. FARM OR LEASE NAME East Poplar Unit	
14. PERMIT NO.		9. WELL NO. No. 74	
15. ELEVATIONS (Show whether DF, RT, GR, etc.) 2160' G.L.		10. FIELD AND POOL, OR WILDCAT East Poplar Unit	
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA SE SW Section 13, T28N, R51E	
		12. COUNTY OR PARISH Roosevelt	
		13. STATE Montana	

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input checked="" type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>	(Other) <input type="checkbox"/>
(Other) <input type="checkbox"/>		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

It is proposed to plug and abandon this well as follows:

Set a bridge plug with wireline at 4700' with a 10" cement plug on top.

Cut 5-1/2" casing off at approximately 3600' and set a 50 sack cement plug at top of casing stub.

Set a 100' cement plug at the top of the Dakota Sand, 3213'.

Set a 100' cement plug (50' in and 50' out) at bottom of 9-5/8" surface casing.

Set a 10' cement plug at top of surface casing. The surface casing will be cut off 4' below ground level and a steel cap welded on top of the 9-5/8" casing.

No dry hole marker is to be erected.

18. I hereby certify that the foregoing is true and correct

ORIGINAL SIGNED BY

SIGNED BILLY G. MELEARTITLE District SuperintendentDATE July 27, 1976

(This space for Federal or State office use)

APPROVED BY David L. Paul
CONDITIONS OF APPROVAL, IF ANY:TITLE DISTRICT ENGINEERDATE 7-30-76

(SUBMIT IN QUADRUPPLICATE)
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	X
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

September 28, 1976

Following is a ~~report of work done~~ on land ~~leased~~ described as follows:

LEASE East Poplar Unit No. 74

MONTANA (State) Roosevelt (County) East Poplar Unit (Field)
Well No. No. 74 SE SW Section 13 T28N R51E MPM
(n. sec.) (Township) (Range) (Meridian)

The well is located 658 ft. from ~~XXX~~ line and 1984 ft. from ~~XXX~~ line of Sec. 13

LOCATE ACCURATELY ON PLAT ON BACK OF THIS FORM THE WELL LOCATION, AND SHOW LEASE BOUNDARY

The elevation of the derrick floor above the sea level is 2160' G.L.

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

This well was plugged and abandoned as follows:

A bridge plug was set at 4710' with a 10' cement plug on top. The casing was cut off at approximately 3754'. A 50 sack cement plug was set in the top of the casing stub. A 100' cement plug was set at the top of the Dakota Sand at 3213'. A 100' cement plug was set at the bottom of the 9-5/8" surface casing, 1/2 in and 1/2 out. A 10' cement plug was set at the top of the surface casing. The surface casing will be cut off 4' below ground level and a steel cap welded on top of the 9-5/8" casing. No dry hole marker is to be erected on this location.

Surface restoration should be completed by November 1, 1976

Approved subject to conditions on reverse of form

Date OCT 6 1976

By *Blaine L. Thompson* District Office Agent

Company Murphy Oil Corporation

By *Billy D. McLean*

Title District Superintendent

Address P.O. Box 547, Poplar, Montana 59255

COMMISSION USE ONLY
API WELL NUMBER

STATE	COUNTY	WELL
25		

NOTE:—Reports on this form to be submitted to the District Agent for Approval in Quadruplicate
WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL.

OVER

(Back of form)

Form 9-331
(May 1963)UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TRIPPLICATE*
(Other instructions on reverse side)Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.

O'Connor

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME

East Poplar Unit

9. WELL NO.

No. 74

10. FIELD AND POOL, OR WILDCAT

East Poplar Unit

11. SEC., T., R., M., OR BLE. AND
SURVEY OR AREASE SW Section 13,
T28N, R51E

12. COUNTY OR PARISH

Roosevelt

13. STATE

Montana

1. OIL WELL ☒ GAS WELL ☐ OTHER ☐

2. NAME OF OPERATOR

Murphy Oil Corporation

3. ADDRESS OF OPERATOR

P.O. Box 547, Poplar, Montana 59255 Billings, Montana

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*
See also space 17 below.)
At surface

658' from South line and 1984' from West line of Section 13

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

2160' G.L.

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

FRACTURE TREAT

SHOOT OR ACIDIZE

REPAIR WELL

(Other)

PULL OR ALTER CASING

MULTIPLE COMPLETE

ABANDON*

CHANGE PLANS

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

FRACTURE TREATMENT

SHOOTING OR ACIDIZING

(Other)

REPAIRING WELL

ALTERING CASING

ABANDONMENT*

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This well was plugged and abandoned as follows:

A bridge plug was set at 4710' with a 10' cement plug on top. The casing was cut off at approximately 3754'. A 50 sack cement plug was set in the top of the casing stub. A 100' cement plug was set at the top of the Dakota Sand at 3213'. A 100' cement plug was set at the bottom of the 9-5/8" surface casing, 1/2 in and 1/2 out. A 10' cement plug was set at the top of the surface casing. The surface casing will be cut off 4' below ground level and a steel cap welded on top of the 9-5/8" casing. No dry hole marker is to be erected on this location.

Surface restoration should be completed by November 1, 1976.

18. I hereby certify that the foregoing is true and correct

SIGNED

Billy D. McLean

TITLE District Superintendent

DATE September 28, 1976

(This space for Federal or State office use)

APPROVED BY

Walter L. Paul

TITLE

SIGNED

DATE

9-30-76

CONDITIONS OF APPROVAL, IF ANY:

GEOLOGICAL DATA

MURPHY 50474

LOCATE WELL CORRECTLY

RECEIVED

AUG 23 1956

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA

(SUBMIT IN TRIPLICATE)
TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

LOG OF WELL

RECEIVED

AUG 31 1956

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGS

803
Form No. 1
(Gen. Rule 206.3 & 231)

Company Murphy Corporation Lease E.P.U. Fee-0'Connor (6011) Well No. 74

Address 602 Midland Bank Bldg, Billings, Montana Field (or Area) East Poplar

The well is located 658 ft. from (S) line and 1984 ft. from (W) line of Sec. 13 (SE SW)

Sec. 13; T. 28N; R. 51E; County Roosevelt; Elevation 2172' K.B.

(D.F., R.B. or G.L.)

Commenced drilling April 10, 1956; Completed May 12, 1956

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as oil well
(oil well, gas well, dry hole)

Signed Harold Milan
Harold Milan

Title Division Production Superintendent

Date August 15, 1956

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From <u>5740'</u>	to <u>5748'</u>	<u>0</u>	<u>"B-1"</u>	From _____	to _____
From <u>5597'</u>	to <u>5604'</u>	<u>0</u>	<u>"A"</u>	From _____	to _____
From _____	to _____			From _____	to _____
From _____	to _____			From _____	to _____

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
9-5/8"	36#	J-55	8rd thd	1038.90'			400	
5-1/2"	15.50#	J-55	8rd thd	5934'			300	

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2-3/8"	4.70#	J-55	8rd thd	5597.50'	open ended

COMPLETION RECORD

Rotary tools were used from 0 to 5930'
Cable tools were used from _____ to _____
Total depth 5930 ft.; Plugged back to 5673' T.D.; Open hole from _____ to _____

PERFORATIONS			ACIDIZED, SHOT, SAND FRACED, CEMENTED			
Interval		Number and Size and Type	Interval		Amount of Material Used	Pressure
From	To		From	To		
5740'	5748'	1/2" jet	5740'	5748'	500 gal. etching acid	4200#psi
5597'	5604'	1/2" jet	5597'	5604'	1000 gal. etching acid	3400#psi

(If P&A show plugs above)

INITIAL PRODUCTION

Well is producing from Madison (pool) formation.

I. P. 43 barrels of oil per 24 hours pumping
(pumping or flowing)

neg Mcf of gas per -- hours.
290 barrels of water per 24 hours, or 87 % W.C.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

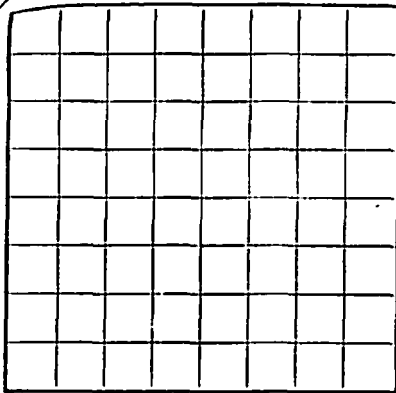
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| | |
|------|--|
| From | |
|------|--|

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|------|--|
| FROM | |
| | |

Form 9-330

U. S. LAND OFFICE Billings
SERIAL NUMBER Fee-0'Connor (6011)
LEASE OR PERMIT TO PROSPECT E.P.U.



LOCATE WELL CORRECTLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company Murphy Corporation Address 602 Midland Bank Bldg., Billings, Mont.
Lessor or Tract E.P.U. Fee-0'Connor (6011) Field East Poplar State Montana
Well No. 74 Sec. 13 T. 28N R. 51E Meridian M.P.M. County Roosevelt
Location 658 ft. N. of S. Line and 1984 ft. E. of W. Line of Section 13 Elevation 2172 ft. M.S.L.
(Derrick base relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed Harold Hilam
Harold Hilam

Date August 15, 1956 Title Division Production Supt.

The summary on this page is for the condition of the well at above date.

Commenced drilling April 10, 1956 Finished drilling May 12, 1956

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

ORIGINAL FORWARDED TO CASPER

No. 1, from 5740' to 5748' No. 4, from _____ to _____
No. 2, from 5597' to 5604' No. 5, from _____ to _____
No. 3, from _____ to _____ No. 6, from _____ to _____

IMPORTANT WATER SANDS

No. 1, from _____ to _____ No. 3, from _____ to _____
No. 2, from _____ to _____ No. 4, from _____ to _____

CASING RECORD

| Size casing | Weight per foot | Threads per inch | Make | Amount | Kind of shoe | Cut and pulled from | Perforated | | Purpose |
|----------------------------|-----------------|------------------|----------|----------|--------------|---------------------|------------|-------|---------|
| | | | | | | | From— | To— | |
| 9-5/8" | 36# | 3 rd thd. | American | 1028.15' | Howco | | | | Surface |
| 5-1/2" | 16.50# | 3 rd thd. | American | 5593.73' | Howco | | 5740' | 5748' | Oil |
| | | | | | | | 5597' | 5604' | Oil |
| HISTORY OF OIL OR GAS WELL | | | | | | | | | |

MUDDING AND CEMENTING RECORD

| Size casing | Where set | Number sacks of cement | Method used | Mud gravity | Amount of mud used |
|-------------|-----------|------------------------|-------------|-------------|--------------------|
| 9-5/8" | 1033.00' | 400 | Pump & Plug | | |
| 5-1/2" | 5933.00' | 300 | Pump & Plug | | |
| | | | | | |
| | | | | | |

PLUGS AND ADAPTERS

Heaving plug—Material _____ Length _____ Depth set _____
Adapters—Material _____ Size _____

FOLD MARK

| Size | Shell used | Explosive used | Quantity | Date | Depth shot | Depth cleaned out |
|------|------------|----------------|----------|------|------------|-------------------|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TOOLS USED

Rotary tools were used from 0 feet to 5930 feet, and from feet to feet

Cable tools were used from feet to feet, and from feet to feet

DATES

July 20 (I.P. test date), 1956 Put to producing August 12, 1956

The production for the first 24 hours was 333 barrels of fluid of which 18% was oil; % emulsion; 87% water; and % sediment. Gravity, °Bé. 40.4

If gas well, cu. ft. per 24 hours Gallons gasoline per 1,000 cu. ft. of gas

Rock pressure, lbs. per sq. in.

EMPLOYEES

, Driller, Driller
Zaph Brooks Drilling Company, Driller

FORMATION RECORD

| FROM— | TO— | TOTAL FEET | FORMATION |
|-------|-----|------------|--------------|
| | | | See attached |

10-4094-8

FORMATION RECORD—COVER

PLEASE PRINT NAME OF PERSON TO WHOM THIS COPY IS TO BE SENT
ADDRESS AND PHONE NUMBER
CITY AND STATE

WELL DRILLING PLAN

Field or Area East Poplar Division Billinga
County or Parish Roosevelt Total Anticipated Depth 5965'
Lease East Poplar Unit Well Name East Poplar Unit Well No. 74
Well Location SE SW Section 18, Township 28 North, Range 51 East

Lowest fresh water sand (For surface casing program): 800'

Casing and tubing program:

| | <u>From</u> | <u>To</u> | <u>Size</u> | <u>Weight</u> | <u>Grade</u> | <u>Bit Size</u> |
|--------------|-------------|--------------|---------------|---------------|--------------|-----------------|
| Conductor | | | | | | |
| Surface | <u>0</u> | <u>1000'</u> | <u>9-5/8"</u> | <u>32.75#</u> | <u>J</u> | <u>12-1/4"</u> |
| Intermediate | | | | | | |
| Production | <u>0</u> | <u>5965'</u> | <u>5-1/2"</u> | <u>15.60#</u> | <u>J</u> | <u>8-3/4"</u> |
| Tubing | <u>0</u> | <u>5965'</u> | <u>2-7/8"</u> | <u>6.40#</u> | <u>J</u> | <u>EUE</u> |

Potential Drilling Hazards None expected

Mud Program Natural to 4400', red mud from 4400' to T.D.

Coring Method and Size Core Bits to be Used 6-1/8" diamond conventional

Intervals Cores to be Analyzed All porosity with show

Method of Drill Stem Testing four hour tests

Anticipated Completion Zone not determined

Method of opening pay, perforation or open hole, and approximate interval: not determined

Expected Formation Treatments

Expected logs for Development, Evaluation, or Completion Purposes In addition to the logs on the Geological Prospectus, a Gamma Ray-Neutron will be run inside production string.

Remarks:

This is a step-out well to define the productive limits of the field.

Date 3/28/56

Production Superintendent

Harold Miller

GEOLOGICAL PROSPECTUS

Division Billings Lease No. 6011
 Operator Murphy Corporation Well Name E. P. U. Well No. 74
 Location: Section C SE SW 13 Township 28N Range 51E
 Pool Name: East Poplar Unit County Roosevelt State Montana
 Type of Well: Oil X Gas Exploratory Development X
 Objective Formation Madison Projected Depth 5985'
 Well Elevation 2170' Gr. (Est.)

Expected Stratigraphic Section and Estimated Depths:

| | | | |
|---------------------|--------------|------------------|--------------|
| Judith River----- | 830 (+1351) | Spearfish----- | 4697 (-2516) |
| Eagle----- | 1211 (+ 970) | Amsden----- | 4800 (-2619) |
| Niobrara----- | 2071 (+ 110) | Heath----- | 4927 (-2746) |
| Greenhorn----- | 2425 (- 244) | Otter----- | 5102 (-2921) |
| Muddy----- | 3006 (- 825) | Kibbey Sand----- | 5239 (-3058) |
| Dakota Silt----- | 3226 (-1046) | Kibbey Lime----- | 5402 (-3221) |
| Morrison----- | 3582 (-1401) | Madison----- | 5497 (-3316) |
| Swift----- | 3667 (-1486) | "A" Zone----- | 5624 (-3443) |
| Riordon----- | 3997 (-1816) | "B-1" Zone----- | 5749 (-3568) |
| Piper Shale----- | 4859 (-2178) | "B-2" Zone----- | 5766 (-3585) |
| Piper Lime----- | 4486 (-2255) | "C" Zone----- | 5911 (-3730) |
| Gypsum Springs----- | 4496 (-2315) | | |

Anticipated Pay Horizons, Net Pay and Expected Depths:

| | | |
|-------------------|-----|-------|
| Judith River----- | 10' | 830' |
| Kibbey Sand----- | 15' | 5257' |
| "A" Zone----- | 10' | 5624' |
| "B-1" Zone----- | 8' | 5749' |
| "B-2" Zone----- | 15' | 5766' |
| "C" Zone----- | 10' | 5911' |

3560
 2172
 5741

Recommended Coring and Formation Testing Program:

Core:

Kibbey - 15'
 "A" Zone - 14'
 "B" Zone - 30'
 "C" Zone - 41'

Test:

Kibbey
 "A" Zone
 "B-1" Zone
 "B-2" Zone
 "C" Zone

Circulate all shows; core and/or test at discretion of well site geologist.
 Circulate Heath sand.

Recommended Sampling and Logging Program:

| | |
|--------------------------------------|--|
| 10' samples from 2000' to 4000' | 2" E.S. log - bottom of casing to T.D. |
| 5' samples from 4000' to T.D. | 5" E.S. log - 2000' to T.D. |
| 5' Drilling time from 2000' to 4000' | 5" Microlog - 2000' to T.D. |
| 1' Drilling time from 4000' to T.D. | 25" Microlog - 5600' to T.D. |

Remarks: (Including pertinent data relative to location accessibility, unusual drilling problems due to surface or subsurface conditions, etc.)

Nearest well control:

E. P. U. No. 20 C S' NE Section 14, T28N, R51E
 E. P. U. No. 26 C S' NE Section 29, T28N, R51E
 This location is 1-1/8 miles northeast of the No. 3-G gas well.
 The Judith River should be closely watched for gas.

Eugene K. Beebley
 Division Geologist

3/28/56
 Date

=====

C O M P L E T I O N D A T A

=====

CASING: Ran 25 jts. (1028.15') of 9-5/8", 36#, J-55, 8rd. thd., ST&C, R-3, American Class "A" casing. Landed 10.75' below RKB at 1038.90'. Howco guide shoe on bottom and 1 Howco centralizer at 1024'. Reciprocated casing 15' for 1 hour while circulating and cementing. Cemented with 400 sacks of regular cement with 2% CaCl₂. Circulated approximately 50 sacks of clean cement to surface. Bumped plug with 800# psi at 5:45 P.M., 4-12-56. Checked plug with Halliburton at 1000# psi, released pressure, float valve held ok.

Ran 185 jts. (5922.75') of 5-1/2", 15.50#, J-55, 8rd. thd., ST&C, R-2, American Class "A" casing. Landed 10.25' below RKB at 5933', 1' off bottom. Howco float shoe on bottom and Howco baffle collar at 5923'. Ran 5 Weatherford centralizers at 5918', 5784', 5726', 5633', and 5594'. Ran 50 Weatherford scratchers from 5933' to 5520'. Reciprocated casing 40' while circulating 1 hour and during cementing. Cemented with 300 sacks of Slo-set cement with 2% gel. Ran 20 barrels of water ahead of the cement. Pumped plug down with water. Bumped plug with 1500# at 7:00 P.M., 5-3-56, released pressure, float held ok.

COMPLETION: Ran Lane Wells Gamma Ray Neutron and Collar logs. Released rig at 6:00 A.M., 5-4-56. Moved in pulling unit to complete. Picked up tubing and ran Baker casing scraper. Ran Baker junk basket and gauge ring. Set Baker Model "DA" production packer at 5720'. Ran tubing with 15' tail pipe and Baker latch-on sub and seal assembly. Latched on to packer and spaced out tubing. Tested casing, packer, and well head with 1500# psi.

Perforated "B-1" Zone 5740'-5748' with Lane Wells tubing string jet gun, 4 jets per foot. Swabbed well dry, obtained no fluid movement. Acidized "B-1" Zone with 500 gallons of Dowell etching acid. Pressured up gradually to 4200# psi and soaked for 1 hour and 23 minutes before obtaining break down at 4050# psi. Injected acid at the rate of 1 BPM at 4200', bleed down pressure 2900#. Opened well to pit, flowed 5 minutes and died. Swabbed load water, spent acid, and began swabbing salt water after 4 trips with swab. Swabbed 1 hour to test tank at the rate of 20.5 BPM. Swabbed salt water with trace of oil, fluid level 4700'. Tubing filled up overnight, TP--25#. Swabbed well 2 hours to pit and 5 hours to tank. Swabbed down to 5300'. Last hour, swabbed at the rate of 7 BPM, salt water with trace of oil. Broke formation down with 2100#. Injected salt water at the rate of 2 BPM at 2000'. Squeezed "B-1" Zone perforation through Baker Model "DA" packer, used 40 sacks of cement. Squeezed at 4200# with 10 sacks in formation, dropped 7 sacks on top of packer, and reversed out 23 sacks. Came out of hole. Tested squeeze job with 2000# on casing, held ok. Ran Baker junk basket. Tried to set Baker Model "DA" production packer. After 3 unsuccessful runs, released Lane Wells and called Schlumberger. Ran Baker junk basket on wireline. Ran and set Baker Model "DA" production packer on wireline, top of packer at 5578'. Ran 2-3/8" tubing with Baker seal nipples and tail pipe.

Completion Data, Continued

3

Perforated "A" Zone 5597'-5604' with Schlumberger's 1-3/4" tubing gun, 5 jets per foot. Ran through tubing. Swabbed tubing dry, no fluid movement. Acidized "A" Zone with 500 gallons of Dowell regular 15% acid. Broke formation with 3400# maximum pressure, broke back to 2200#, injected only 2 barrels (84 gallons) into formation. Opened to pit, would not flow. Swabbed displacement water and acid, swabbed down to 5500', made 2 dry runs with swab. Waited 30 minutes. Recovered 2.23 barrels fluid, 2% water, shut in to let set overnight. Fluid level rose to 400' of surface in 12 hours. Swabbed down in 1 hour. Recovered 13 barrels fluid emulsified, 15% water on shakeout. Swabbed 6 hours at the rate of 2 BFPH, 15% water.

Reacidized "A" Zone, 5597'-5604' with 500 gallons of Dowell etching acid. Injected 1 BPH at 2150#, bleed down pressure 1600#. Opened to pit, flowed stream for 10 minutes, died, swabbed displacement water and spent acid. Swabbed 2 hours. Swabbed at the rate of 20.5 BFPH, 65-70% water. Fluid level 3500' to 4000'.

Ran bottom hole pressure on static BHP extrapolated to datum of -3550' subsea equals 2750#; at -3600' equals 2765#. Shut in at 6:00 P.M., 5-12-56. Pressure taken at 8:00 A.M., 5-14-56. Total shut in time 34 hours. BHT equals 238 degrees at 5550'. Surface tubing pressure 425#, casing pressure 0# because of packer.

Tubing record (2-3/8", 4.70#, J-55, 8rd. thd., American Class "A" tubing) --

| | |
|------------------------|------------------------------|
| Top joint | 30.90 |
| Pup joint | 6.01 |
| Pup joint | 10.02 |
| Number of total joints | 5533.00 |
| Top of packer | 5579.93 (5587' Schlumberger) |
| Baker latch-on sub | .50 |
| Baker c.o. assembly | 2.50 |
| Tail pipe | 14.66 |
| Bottom of tail pipe | 5597.59 |

Tested well as follows:

- 5-14-56: Flowed on 1/4" choke for 4 hours, flow rate 114 BFPD, 9% water (104 BOPD, 10 BWPD), TFP--10#. Moved in 500 barrel tank, tested overnight (11 hours), flowed on 1/4" choke at rate of 89 BFPD, 40% BS&W (53 BOPD, 36 BWPD), TFP--10#.
- 5-15-56: Flowed on 1/4" choke for 24 hours at rate of 72 BFPD, 60% water (29 BOPD, 43 BWPD), TFP--10#.
- 5-16-56: Flowed on 32/64" choke for 23 hours at rate of 106 BFPD, 50% water (53 BOPD, 53 BWPD).
- 5-17-56: Flowed on 1/2" choke for 4 hours at rate of 106 BFPD, 50% water (53 BOPD, 53 BWPD), TFP--10#.

Completion Data, Continued

5-18-56: Flowed 93 BFPD, 56% water (41 BOPD, 52 BWPD).
5-19-56: Flowed 85 BFPD, 54% water (39 BOPD, 46 BWPD), 1/2" choke, TFP-5".
5-20-56: Flowed 85 BFPD, 57% water (37 BOPD, 48 BWPD), 1/2" choke, TFP-5".
5-21-56: Flowed 81 BFPD, 60% water (32 BOPD, 49 BWPD), 24 hours, TFP-5".
5-22-56: Flowed 75 BFPD, 60% water (30 BOPD, 45 BWPD).
5-23-56: Flowed 87 BFPD, 65% water (31 BOPD, 56 BWPD).
5-24-56: Flowed 67 BFPD, 65% water (23 BOPD, 44 BWPD), open flow.
5-25-56: Set pumping unit.
5-26-56: Pumped 95 BFPD, 65% water (14 BOPD, 81 BWPD), well not leveled off.
5-27-56: No test.
5-28-56: Pumped 344 BFPD, 85% water (52 BOPD, 292 BWPD), 24 hour test.
5-29-56: Pumped 265 BFPD, 75% water (66 BOPD, 199 BWPD).
5-30-56: Pumped 194 BFPD, 70% water (58 BOPD, 136 BWPD).
5-31-56: Pumped 226 BFPD, 74% water (59 BOPD, 167 BWPD).
6-1-56: Pumped 108 BFPD, 70% water (32 BOPD, 76 BWPD), 24 hour test.
6-2-56: Pumped 168 BFPD, 71% water (49 BOPD, 119 BWPD), 24 hour test.
6-3-56: Pumped 118 BFPD, 68% water (38 BOPD, 80 BWPD).
6-4-56: No test.
6-5-56: Pumped 195 BFPD, 77% water (45 BOPD, 150 BWPD).
6-5-56: Fluid tested 2 hours 216 BFPD, 77% water (50 BOPD, 166 BWPD).
24 hour test through gun barrel 191 BFPD, 77% water (44 BOPD, 147 BWPD).
6-7-56: Pumped 169 BFPD, 76% water (40 BOPD, 129 BWPD).
6-8-56: Pumped 177 BFPD, 77% water (41 BOPD, 136 BWPD).
6-9-56: No test.
6-10-56: No test.
6-11-56: Pumped 183 BFPD, 83% water (31 BOPD, 152 BWPD).
6-13-56: Pumped 191 BFPD, 82% water (34 BOPD, 157 BWPD).
6-17-56: Pumped 218 BFPD, 85% water (33 BOPD, 185 BWPD).
6-18-56: Pumped 233 BFPD, 91% water (21 BOPD, 212 BWPD).
6-25-56: Pumped 239 BFPD, 93% water (17 BOPD, 222 BWPD).

Pulled rods and started out of hole with 2-3/8" tubing. Ran 73 jts. of 2-3/8" tubing and 106 jts. of 2-7/8" tubing. Ran rods with 2" double volume pump spaced at 3300'. Continued testing as follows:

6-29-56: Pumped 404 BFPD, 90% water (40 BOPD, 364 BWPD), 2 hour fluid test. Production for 24 hours was 33 barrels of clean oil.
6-30-56: Pumped 397 BFPD, 89% water (44 BOPD, 353 BWPD).
7-1-56: Pumped 441 BFPD, 90% water (44 BOPD, 397 BWPD).
7-2-56: Pumped 516 BFPD, 90% water (51 BOPD, 465 BWPD). Production in tank 49 BOPD.
7-3-56: Pumped 465 BFPD, 88% water (56 BOPD, 409 BWPD).
7-4-56: Pumped 406 BFPD, 88% water (49 BOPD, 357 BWPD).
7-7-56: Pumped 397 BFPD, 93% water (28 BOPD, 369 BWPD).
7-8-56: Pumped 397 BFPD, 90% water (40 BOPD, 357 BWPD).

Completion Data, Continued

7-9-56: Pumped 328 BFPD, 90% water (33 BOPD, 295 BWPD).
7-10-56: Pumped 431 BFPD, 92% water (35 BOPD, 396 BWPD).
7-11-56: Pumped 410 BFPD, 92% water (33 BOPD, 377 BWPD).
7-12-56: No test.
7-13-56: Pumped 418 BFPD, 86% water (58 BOPD, 360 BWPD), 2 hour test.
7-14-56: No test.
7-15-56: Pumped 419 BFPD, 85% water (62 BOPD, 348 BWPD).
7-18-56: Pumped 455 BFPD, 89% water (50 BOPD, 405 BWPD), 2 hour test.
7-19-56: Pumped 397 BFPD, 88% water (48 BOPD, 349 BWPD), 2 hour test.
7-20-56: Pumped 338 BFPD, 87% water (43 BOPD, 290 BWPD), 24 hour test,
this is the initial potential.
7-21-56: Pumped 334 BFPD, 87% water (44 BOPD, 290 BWPD), 24 hour test.
7-22-56: Pumped 333 BFPD, 87% water (43 BOPD, 290 BWPD), 24 hour test.
7-23-56: Pumped 292 BFPD, 87% water (38 BOPD, 254 BWPD), 24 hour test.
7-24-56: Pumped 394 BFPD, 89% water (43 BOPD, 351 BWPD), 24 hour test.
7-25-56: Pumped 353 BFPD, 89% water (39 BOPD, 314 BWPD), 20 hour test.

Set permanent pumping unit and continued testing.

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E L E C T R O L O G D A T A

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TYPE OF LOGINTERVAL LOGGED

| | |
|-----------------------------------|---------------|
| Schlumberger Electrical Survey 2" | 1080'-5929' |
| Schlumberger Electrical Survey 5" | 2000'-5929' |
| Schlumberger Microlog 5" | 2000'-5927' |
| Schlumberger Microlog 25" | 5500'-5927' |
| Schlumberger Perforating Record | 5597'-5604' |
| Lane Wells Gamma Ray Log | 2900'-5909' |
| Lane Wells Neutron Log | 2900'-5918.5' |

LOG TOPS

| | Depth | Datum | Thickness |
|-----------|-------|-------|-----------|
| Eagle | 1209 | + 962 | |
| Greenhorn | 2417 | - 244 | |
| Graneros | 2623 | - 450 | |
| U. Muddy | 2775 | - 602 | |
| Muddy Sd | 2995 | - 823 | |
| Dakota | 3213 | -1040 | |
| Morrison | 3603 | -1435 | |
| Vanguard | 3980 | -1807 | |
| Rierdon | 4161 | -1988 | |
| Piper Sh | 4333 | -2160 | |
| Piper Ls | 4411 | -2238 | |
| Spearfish | 4688 | -2515 | |
| Amsden | 4805 | -2632 | |
| Heath | 4923 | -2750 | |
| Otter | 5078 | -2905 | |
| Kibbey Sd | 5248 | -3075 | |
| Kibbey Ls | 5400 | -3227 | |
| Madison | 5496 | -3323 | |
| A-1 | 5567 | -3394 | 2' |
| A-2 | 5584 | -3411 | 5' |
| A-3 | 5599 | -3426 | 12' |
| A-4 | 5612 | -3439 | 23' |
| B-1 | 5742 | -3569 | 8' |
| B-2 | 5758 | -3585 | 16' |
| B-3 | 5781 | -3608 | 5' |
| B-4 | 5812 | -3639 | 4' |
| B-5 | 5847 | -3674 | ? |
| C-1 | 5880 | -3707 | ? |
| C-2 | 5904 | -3731 | 9' |

D R I L L S T E M T E S T S

- A³ D.S.T. #1: 5598'-5607' ("A" Zone), Halliburton straddle packer test, 1/2" bottom choke, no water cushion. Tool open 4 hours, shut in 30 minutes. Tool opened with a fair blow, increased to medium blow after 30 minutes. Recovered 1720' gas, 380' clean oil, 30' oil-and-gas-cut mud, no water. IBHFP--15#, FBHFP--130#, BHSIP--2532#, Hydro--3390#.
- A⁴ D.S.T. #2: 5609'-5625' ("A" Zone), Halliburton single packer test, 1/2" bottom choke, no water cushion. Tool open 1 hour, shut in 15 minutes. Tool opened with strong blow and remained same throughout test. Recovered 1820' gas, 180' clean oil, 60' oil-and-gas-cut mud, 630' salt and sulphur water. IBHFP--15#, FBHFP--392#, BHSIP--2818#, Hydro--3330#.
- D.S.T. #3: 5749'-5760' ("B-2" Zone), misrun, could not get in hole with tester. Reran D.S.T. #3, 5749'-5760', Howco straddle packer test, 1/2" bottom choke, no water cushion. Tool open 4 hours, closed 30 minutes. Tool opened with weak blow, remained same throughout test. Recovered 450' gas, 330' salt water with trace of oil. IBHFP--15#, FBHFP--130#, BHSIP--2660#, Hydro--3180#.
- D.S.T. #4: 5735'-5748' ("B-1" Zone), Halliburton straddle packer test, 1/2" bottom choke, 1/4" top choke, no water cushion. Tool open 4 hours, shut in 30 minutes. Tool opened with weak blow for 1st hour, increased to medium blow for rest of test. Recovered 450' gas, 30' clean oil, and 270' of salt water with show of oil. IBHFP--15#, FBHFP--130#, BHSIP--1992#, Hydro--3200#.
- 61
D.S.T. #5: 5891'-5902' ("B-1" Zone), Halliburton straddle packer test, 1/2" bottom choke, no water cushion. Tool open 4 hours, shut in 30 minutes. Tool opened with weak blow, continued throughout test. Recovered 540' gas, 5' clean oil, 105' oil-and-gas-cut mud, and 45' muddy salt water. IBHFP--15#, FBHFP--35#, BHSIP--2820#, Hydro--3265#.

CORE ANALYSIS REPORTS

Company MURPHY CORPORATION Date 5-4-56 Lab No. 560 Well No. Unit #74 Location C NW SW 13-28N-51E

Formation A Zone & B-1 & B-2 Zone Field East Poplar County Roosevelt State Montana Depths 5595-5746.5'

| Sample No. | Representative of Foot | Midpoint of Sample | Footage | PERMEABILITY | | Effective Porosity % | DENSITY | | SATURATION % OF PORE SPACE | |
|------------|------------------------|--------------------|----------|--------------|----------------|----------------------|---------|--------|----------------------------|-------|
| | | | | Radial | Vertical | | Bulk | Matrix | Residual Oil | Water |
| | CORE #2 | 5595-5625 | | | A Zone | | | | | |
| NS | 5595-97 | 5595-56 | | | | | | | | |
| 1 | 97-98 | | | 35 | 3.87 | 4.6 | 2.53 | 2.66 | 5.4 | 40.0 |
| 2 | 98-99 | | | U.T. | 0.96 | 1.4 | 2.63 | 2.66 | 0.0 | 15.7 |
| 3 | 5599-5600 | | | U.T. | 4.42 | 2.0 | 2.62 | 2.67 | 5.5 | 70.5 |
| 4 | 5600-01 | | | U.T. | 1.35 | 1.1 | 2.64 | 2.67 | Tr. | 61.8 |
| 5 | 01-02 | | | 4.63 | 0.92 | 0.4 | 2.67 | 2.68 | 0.0 | 95.0 |
| 6 | 02-03 | | | 0.82 | 1.23 | 1.6 | 2.65 | 2.69 | 0.0 | 26.3 |
| NS | 03-14 | | | | | | | | | |
| 7 | 14-15 | | | 2.94 | U.T. | 5.6 | 2.56 | 2.72 | 0.0 | 27.5 |
| NS | 15-16 | | | | | | | | | |
| 8 | 16-17 | | | U.T. | 0.16 | 4.8 | 2.59 | 2.72 | Tr. | 44.2 |
| 9 | 17-18 | | | 2.81 | 0.43 | 5.9 | 2.54 | 2.70 | Tr. | 78.4 |
| 10 | 18-19 | | | 1.01 | 0.09 | 9.0 | 2.44 | 2.69 | Tr. | 90.8 |
| 11 | 19-20 | | | 0.10 | 0.40 | 1.7 | 2.62 | 2.67 | 3.4 | 84.4 |
| 12 | 20-21 | | | 20 | 0.69 | 6.9 | 2.56 | 2.75 | 0.0 | 57.1 |
| 13 | 21-22 | | | 8.89 | 2.14 | 9.1 | 2.44 | 2.69 | 1.3 | 79.7 |
| 14 | 22-23 | | | 69 | 35 | 15.8 | 2.27 | 2.69 | 17.3 | 30.6 |
| 15 | 23-24 | | | 4.94 | 1.54 | 11.7 | 2.38 | 2.69 | 0.0 | 70.8 |
| | CORE #4 | 5732-72 | Res. 40' | | B-1 & B-2 Zone | | | | | |
| NS | 5732-30 | | | | | | | | | |
| 16 | 30-39 | | | 1.17 | 1.44 | 11.2 | 2.36 | 2.66 | 11.8 | 63.7 |
| 17 | 39-40 | | | 3.28 | 1.41 | 15.1 | 2.26 | 2.66 | 13.9 | 48.9 |

CORE ANALYSIS REPORTS CONTINUED

| Sample No. | Representative of Feet | Midpoint of Sample | Footage | PERMEABILITY | | Effective Porosity % | DENSITY | | SATURATION % OF PORE SPACE | |
|------------|------------------------|--------------------|---------|--------------|----------|----------------------|---------|--------|----------------------------|-------|
| | | | | Radial | Vertical | | Bulk | Matrix | Residual Oil | Water |
| 18 | 40-40.5 | | | 0.75 | 0.31 | 10.5 | 2.38 | 2.66 | 5.9 | 32.5 |
| NS | 40.5-42.5 | | | | | | | | | |
| 19 | 42.5-43.5 | | | 1.20 | 0.93 | 7.2 | 2.48 | 2.67 | 7.1 | 57.5 |
| 20 | 43.5-44.5 | | | 3.38 | 2.11 | 11.7 | 2.34 | 2.65 | 11.5 | 35.8 |
| 21 | 44.5-45.5 | | | 9.30 | 5.69 | 15.6 | 2.23 | 2.64 | 24.2 | 28.7 |
| 22 | 45.5-46.5 | | | 18 | 3.85 | 15.3 | 2.26 | 2.67 | 27.0 | 29.3 |
| 23 | 5746.5-47.5 | | | 4.63 | 3.08 | 13.0 | 2.34 | 2.69 | 25.2 | 48.0 |
| NS | 47.5-55 | | | | | | | | | |
| 24 | 56-57 | | | 0.56 | 0.60 | 11.8 | 2.36 | 2.67 | Tr. | 68.6 |
| 25 | 57-58 | | | 2.36 | 1.36 | 15.3 | 2.25 | 2.66 | 11.9 | 47.5 |
| 26 | 58-59 | | | 1.31 | 0.61 | 10.4 | 2.41 | 2.69 | 9.1 | 85.2 |
| 27 | 59-60 | | | 2.21 | 1.35 | 12.4 | 2.32 | 2.65 | 2.8 | 50.9 |
| 28 | 60-61 | | | 1.32 | 1.13 | 7.4 | 2.50 | 2.70 | 0.0 | 37.0 |
| 29 | 61-62 | | | 2.39 | 0.74 | 3.8 | 2.60 | 2.70 | Tr. | 75.4 |
| 30 | 62-63 | | | 0.83 | 0.18 | 3.4 | 2.55 | 2.64 | Tr. | 82.3 |
| 31 | 63-64 | | | U.T. | 1.41 | 4.4 | 2.57 | 2.68 | 0.0 | 79.1 |
| 32 | 64-65 | | | 1.65 | 0.67 | 10.4 | 2.40 | 2.68 | Tr. | 56.5 |
| 33 | 65-66 | | | 0.49 | 0.20 | 0.1 | 2.44 | 2.66 | Tr. | 44.2 |
| 34 | 66-67 | | | 1.96 | 1.28 | 12.1 | 2.37 | 2.69 | 3.4 | 35.7 |
| 35 | 67-68 | | | 4.23 | 2.24 | 13.7 | 2.31 | 2.68 | 11.3 | 45.3 |
| 36 | 68-69 | | | 2.88 | 2.85 | 10.7 | 2.37 | 2.65 | 4.0 | 80.1 |
| 37 | 69-70 | | | 2.08 | 2.16 | 13.0 | 2.34 | 2.69 | 6.8 | 37.6 |

CORE DESCRIPTIONS

Core No. 1 5255 - 5296', recovered 40':

- 1'6" Sandstone: red, quartzitic, hard, tight, no show.
- 3'6" Shale: dark gray, stringers mottled red and green, hard, dense.
- 2'6" Sandstone: dark gray, quartzitic, no permeability and porosity, no show.
- 1'0" Claystone: cream to buff.
- 4'0" Sandstone: gray, quartzitic, hard, tight, no show.
- 2'6" Sandstone: as above, open vertical fracture filled with calcite, no show on fracture plane or matrix.
- 2'0" Sandstone: medium grain, red, trace permeability and porosity, open vertical fractures, no show.
- 4'0" Sandstone: fine grained, red and purple, hard, tight, no show, stringers of gray, platy shale.
- 5'0" Sandstone: as above, trace of permeability and porosity, no show.
- 5'0" Sandstone: fine grain, hard, tight, no permeability and porosity, no show.
- 9'0" Sandstone: red, medium grain, good permeability and porosity, no fluorescence or cut, no odor, appears wet.

Core No. 2 5595 - 5625', recovered 29':

- 2'0" Anhydrite: dark gray, dense.
- 6'0" Limestone: dark gray, brown, finely crystalline, numerous hairline fractures, (no open vertical), good oil odor on fresh break, good cell cut, bright golden fluorescence on fracture planes and in matrix, fair permeability and porosity, bottom two foot tighter.
- 7'0" Limestone: dark gray brown, dense, no fracturing, no show.
- 1'0" Limestone: gray, brown, fine crystalline, trace permeability and porosity with fair fluorescence and odor, no fracturing.
- 2'0" Limestone: dark gray, lithographic.
- 1'0" Limestone: dark gray brown, fine crystalline, trace permeability and porosity with fair fluorescence and odor, no fracturing.
- 3'0" Limestone: dark gray, dense, hairline fractures bleeding oil, fluorescence on fracture planes, no show in matrix, fractures lead into porosity below.
- 7'0" Limestone: dark gray brown, medium crystalline, good golden fluorescence in matrix, good odor on fresh break.

Core No. 3 5720 - 5732', recovered 11':

- 6'6" Anhydrite: dark gray, dense, shaley.
- 4'6" Anhydrite: (rock salt) large solution vugs.

CORE DESCRIPTIONS CONTINUED

Core No. 4 5732 - 5772', recovered 40':

- 6'0" Anhydrite: dark gray, dense, no fractures.
2'6" Limestone: dark gray, brown, finely crystalline, fair permeability and porosity, good golden fluorescence, good oil odor and taste on fresh break.
2'0" Limestone: dark gray, black, platy shale partings, no permeability and porosity, spotted golden fluorescence.
5'0" Limestone: dark gray brown, finely crystalline, good permeability and porosity, light golden fluorescence, good oil odor and taste.
8'6" Anhydrite: dark gray, hard, dense.
4'6" Limestone: dark gray brown, fine crystalline, good to fair permeability and porosity, good to spotted fluorescence and cut, good oil odor, no visible fracturing.
1'6" Limestone: as above, slightly tighter with a 3' open vertical fracture.
8'0" Limestone: dark gray brown, finely crystalline, good permeability and porosity, spotted to good fluorescence and cut, good oil odor in top 6' of unit, bottom 2' has both sulfur and oil odor.
2'0" Limestone: dark gray to black, completely shattered.

Core No. 5 5880 - 5920', recovered 40':

- 14'0" Limestone: gray to dark gray, dense, thin black shale partings.
5'0" Limestone: dark gray, brown, dense, open vertical fracturing, no matrix show, fracture planes have oil staining and even to spotted golden fluorescence.
9'6" Limestone: dark gray brown, finely to micro crystalline, earthy, poor permeability and porosity, fair gas odor, spotted light golden fluorescence, fracturing above extending into intercrystalline 4'6" from top of unit, 18' fracture zone (vertical and horizontal with no fluorescence on planes), bottom 4' looks wet.
1'6" Limestone: dark gray, dense, no permeability and porosity, no show.
4'0" Limestone: dark gray brown, microcrystalline, trace of permeability and porosity, gas odor, spotted fluorescence, entire unit appears wet.
6'0" Limestone: dark gray, dense, no show.

MUD PROGRAM SUMMARY

MUD SERVICE CO.

Northern Mud Co.

MUD ADDITIVES AND COST:

| Material | Surface Hole | | Surface to T.D. | | Total | |
|--------------|--------------|----------|-----------------|----------|-------|----------|
| | Amt. | Cost | Amt. | Cost | Amt. | Cost |
| Magcobar | 420 | 1,187.55 | 32 | 90.48 | 452 | 1,278.03 |
| Magcogel | 118 | 255.59 | 124 | 268.56 | 242 | 524.17 |
| Cement | 5 | 9.25 | | | 5 | 9.25 |
| Hulls | 21 | 94.50 | 4 | 18.00 | 25 | 112.50 |
| Magcophos | 1 | 27.50 | | | 1 | 27.50 |
| Caustic Soda | | | 54 | 729.00 | 54 | 729.00 |
| Quebracho | | | 73 | 967.25 | 73 | 967.25 |
| Driscose | | | 12 | 540.00 | 12 | 540.00 |
| Total Mud | | 1,574.39 | | 2,613.31 | | 4,187.70 |
| Drayage | | 151.50 | | 101.97 | | 253.47 |
| Federal Tax | | 4.55 | | 3.06 | | 7.61 |
| TOTAL | | 1,730.44 | | 2,718.34 | | 4,448.78 |

| UNIT MUD COSTS: | Total | Feet | Cost Per | Days | Cost Per |
|-----------------|----------|-------|----------|--------|----------|
| | Cost | Drld. | Foot | Used | Day |
| Spud - T.D. | 4,448.78 | 5930 | .75 | 22 1/2 | 197.72 |
| Spud - Surface | 1,730.44 | 1092 | 1.58 | 1 1/2 | 1,153.63 |
| Surface - T.D. | 2,718.34 | 4838 | .56 | 21 | 129.44 |

MUD PROPERTIES:

| Depth | Weight | Viscosity | Water Loss | pH | Remarks |
|-----------|--------|-----------|------------|------|------------------|
| 0 - 600 | | | | | Water |
| 600-1092 | 10.3 | 49 | | | Set Surface |
| 1092-4300 | | | | | Water = Drilling |
| 4300 | 9.7 | 84 | | | |
| 4731 | 9.9 | 46 | 12.6 | 13 | |
| 5100 | 10.3 | 52 | 13.2 | 13 | |
| 5400 | 10.2 | 51 | 14.2 | 13 | |
| 5700 | 10.4 | 62 | 14.2 | 13.5 | |
| 5930 | 10.4 | 57 | 13.2 | 13 | T. D. |

SUMMARY:

A 12 1/4" surface hole was drilled to 1092' and 9 5/8" casing was landed at 1039'. At 800', additions of gel and barite were made to control a water flow from the Judith River Sand. Circulation was lost and cottonseed hulls were added to gain returns. Cement was also added to the mud to raise the gel strength and thereby aid in removing gravel. Magcophos was added to reduce the gel strength before running casing.

Mud Program Summary Continued

Water was then used to drill an 8 3/4" hole to 4200' at which point conversion to a high pH red mud was begun. The pH was raised to 13 and the viscosity was lowered from 79 to 46 with additions of caustic soda and quebracho. Hourly treatments of caustic soda and quebracho were added to maintain the pH above 12, with gel or water when needed, and to control the viscosity. Barite was added when necessary to control the weight from 10.2 to 10.4# per gallon. Below 5200', Driscose was added to control the water loss under 15 cc.

Five cores were cut and five drill stem tests were run. Good hole conditions were maintained throughout the drilling and logging of the well. The 5 1/2" casing was set at 1' off bottom at 5933' without difficulty.

Considering the amount of coring and testing done, the mud cost for drilling below surface casing was not excessive. The cost for surface mud was slightly higher than normal for the mud weight required.

D R I L L I N G B I T R E C O R D

| Bit No. | Make | Size | Type | Serial No. | Depth Out |
|---------|--------|--------|-------|------------|-----------|
| 1 | Hughes | 12 1/4 | OSC3 | Re-Run | 1092 |
| 2 | Sec. | 8 3/4 | S3P | 108473 | 3223 |
| 3 | " | " | S6 | 112851 | 3137 |
| 4 | Hughes | " | OSC10 | 77558 | 3664 |
| 5 | Sec. | " | S6 | 121949 | 4186 |
| 6 | " | " | " | 112897 | 4510 |
| 7 | " | " | " | 121956 | 4740 |
| 8 | " | " | " | 121946 | 4912 |
| 9 | Hughes | " | CWV | 85958 | 5102 |
| 10 | " | " | " | 85957 | 5181 |
| 11 | " | " | " | 5340 | 5255 |
| 12 | " | " | " | 5358 | 5391 |
| 13 | " | " | " | 85959 | 5481 |
| 14 | Sec. | " | S6 | 100136 | 5595 |
| 15 | Hughes | " | CWV | 85508 | 5720 |
| 16 | Sec. | " | MLN | 76087 | 5880 |
| 17 | Hughes | " | CWV | 85810 | 5935 T.D. |

T O T A L R E C O R D

| Depth Out | Degrees Off |
|-----------|-------------|
| 215 | 1/2 |
| 875 | 0 |
| 2509 | 3/4 |
| 3190 | 0 |
| 3886 | 3/4 |
| 4570 | 1/4 |
| 5102 | 1 |
| 5720 | 1/4 |

Christensen Diamond Core Bit Record

| Core No. | Bit No. | Size | From | To | Footage |
|----------|---------|----------------|------|------|---------|
| 1 | V-3028 | 7 7/8 x 4" | 5255 | 5596 | 41 |
| 2 | Z-3115 | 6 1/8 x 3 1/2" | 5595 | 5625 | 30 |
| 3 | Z-3115 | " | 5720 | 5732 | 12 |
| 4 | Z-3115 | " | 5732 | 5772 | 40 |
| 5 | Z-3115 | " | 5880 | 5920 | 40 |

=====

S A M P L E D E S C R I P T I O N

=====

2000 2060 Shale: light gray, micaceous; trace of fine grained white sandstone.

2060 2160 Shale: medium to dark gray with calcareous tan specks; trace of above sandstone.

2160 2230 Shale: medium gray, soft; trace of buff, earthy limestone.

2230 2420 Shale: light gray, firm; trace of fine grain sandstone.

2415 Sample Top Greenhorn

2420 2620 Shale: dark gray, calcareous, micaceous with tan calcareous specks; some light gray, sandy siltstone.

2620 2770 Shale: dark gray to gray brown; trace of brownish lignite; some gray, limy silty shale.

2770 2920 Shale: as above with some soft, friable, medium grained sandstone, poor permeability and porosity, no show.

2920 2940 Sandstone: medium grained, unconsolidated, well rounded, spotted brown oil stain and spotted golden fluorescence, fair cell cut, shale as above.

2940 3000 Shale: black to dark gray; trace of white limestone; trace of above sandstone.

2995 Sample Top Muddy

3000 3220 Shale: black to dark gray; trace of gray siltstone, slightly glauconitic.

3220 Sample Top Dakota

3220 3340 Shale: dark gray to black; very fine grained silty sandstone; also gray siltstone.

3340 3360 Sandstone: fine grain, silty white to dirty gray; shale brown with traces of glauconitic, also black splintery shale.

3360 3440 Shale: black, marine; trace of above sandstone.

3440 3480 Sandstone: very fine grain, white; trace of gray siltstone and black poker chip shale.

(SIN 3518 equals 3505 Driller, no samples)

3480 3590 Shale: black to dark gray; trace of above sandstone.

SAMPLE DESCRIPTION CONTINUED

3590 Sample Top Morrison

3590 3620 Siltstone: light gray, sandy; shale as above, black splintery.

3620 3660 Shale: black, splintery; trace of above siltstone.

3655 Sample Top Swift

3660 3680 Sandstone: medium to fine grained, silty; trace of glauconite, fair permeability and porosity, no show.

3680 3740 Shale: black, marine, poker chip; trace of above sandstone.

3740 3980 Shale: black, splintery; trace of glauconitic sandstone; some light gray shale stringers.

3980 Sample Top Vanguard (5' samples to TD)

3980 4050 Sandstone: fine grain, gray, fair permeability and porosity, no show; black splintery shale; light gray siltstone.

4050 4150 Shale: splintery, black, massive; above sandstone and siltstone.

4150 4165 Shale: both dark gray and light gray; sandstone, fine grain, silty; trace of light gray siltstone and pyrite.

4165 Sample Top Rierdon

4165 4200 Sandstone: fine grain, dark gray, silty; black splintery shale and soft, medium gray sandstone.

4200 4285 Shale: light and dark gray to black; trace of above sandstone; some light colored buff limestone.

4285 4340 Shale: as above with buff to white bedded limestone.

4335 Sample Top Piper Shale

4330 4410 Shale: light gray with some brown to red; trace of white lime.

4410 Sample Top Piper Lime

4410 4470 Limestone: light gray brown; trace of oolitic; some light brown sandy shale; some white anhydrite.

4470 Sample Top Gypsum Springs

4470 4505 Shale: light to dark gray; some white, medium grain sandstone, no show.

4505 4580 Shale: light gray with traces of light brown; trace of soft, white anhydrite.

4580 4600 Limestone: light gray brown, trace of permeability and porosity, no show; black marine shale and soft white anhydrite.

SAMPLE DESCRIPTION CONTINUED.

4600 4680 Shale: light to dark gray; trace of the above limestone; some silty gray shale.

4685 Sample Top Spearfish

4680 4790 Shale: multi-colored, mostly red with above dark gray and black; trace of buff colored limestone.

4795 Sample Top Ansdan

4790 4870 Dolomite, light cream to buff; trace of permeability and porosity; no show; some light gray anhydrite; some light gray-green silty shale.

4820 4860 Shale: as above; trace of lime and dolomite.

4850 4920 Limestone: light gray, dense, bedded; multi-colored shales, purple dark gray to black, some greens.

4920 Sample Top Heath

4920 4950 Shale: dark gray to black, white to light gray; lime as above.

4950 4960 Sandstone: hard, fine grained, red, poor permeability and porosity, no show; shale as above.

4960 4975 Shale: red and black, splintery.

4975 4990 Sandstone: medium grained, hard, tight, fair permeability and porosity, no show; red.

4990 5010 Shale: multi-colored, red, gray, brown.

5010 5120 Sandstone: red and purple, medium grain, some permeability and porosity, no show; shale as above.

5020 5055 Shale: multi-colored as above.

5055 5065 Sandstone: red and white, medium grain, hard, tight, poor permeability and porosity, no show.

5065 5075 Shale: dark gray, brown, red; trace of above sandstone.

5075 5085 Shale: light to dark gray, splintery; brown and black shales.

5080 Sample Top Otter

5085 5135 Shale: as above with first apple green shales; sandstone: medium grain, dark brown to white, hard tight, fair permeability and porosity, no show.

5135 5155 Shale: as above with no sandstone.

5155 5175 Shale: dark red, sandy, with black splintery and apple green.

SAMPLE DESCRIPTION CONTINUED

- 5175 5245 Shale: as above with scattered traces of calcareous gray siltstone.
- 5245 Sample Top Kibbey Sandstone
- 5245 5255 Shale: multi-colored as above, black, red and purple; limestone, soft, white and gray, hard; dense, gray siltstone.
- 5255 Core No. 1 5255-5296, recovered 40'.
- 5296 5300 Shale: dark red, sandy; trace of medium grain, red sandstone.
- 5300 5315 Sandstone: dark red, medium shale, sub angular, fair permeability and porosity, no show.
- 5315 5335 Shale: dark gray to black and red.
- 5335 5350 Sandstone: medium grained, red, fair permeability and porosity, no show.
- 5350 5385 Shale: red, sandy; trace of red and white sandstone, no show.
- 5385 5395 Shale: dark gray to black, splintery.
- 5395 Sample Top Kibbey Limestone
- 5395 5430 Limestone: dark gray brown, dense; above dark gray, splintery shale.
- 5430 5475 Shale: dark gray to black, marine.
- 5495 Sample Top Madison
- 5495 5500 Anhydrite: soft, white, dense, dark gray shales as above; trace fine grain, tight, reddish sandstone.
- 5500 5560 Limestone: light gray brown, dense, no permeability and porosity, no show.
- 5560 5585 Limestone: light gray brown, pseudo oolitic; trace of permeability and porosity, no fluorescence or show after drying.
- 5585 5595 Anhydrite: dark gray, dense.
- 5595 5625 Core No. 2, cut 30', recovered 29'.
- 5625 5640 Limestone: as in core No. 2 with decrease in show with depth.
- 5640 5675 Limestone: dark gray, dense; hard gray anhydrite.
- 5675 5695 Salt by drilling time, samples mostly anhydrite.
- 5695 5720 Limestone: dark gray brown, fine crystalline, dense with both soft and hard gray anhydrite; trace of brown dolomite.

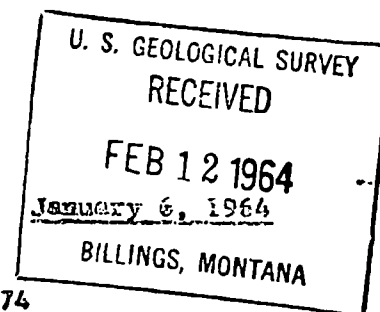
SAMPLE DESCRIPTION CONTINUED

5720 5732 Core No. 3, cut and recovered 11'.
5732 5772 Core No. 4, recovered 40'.
5772 5800 Limestone: dark gray, finely crystalline, fair permeability and porosity; some brown dolomite, poor permeability and porosity, no show; black shales.
5800 5840 Limestone: gray, dense; dolomite, brown, dense; trace of anhydrite.
5840 5880 Limestone: dark gray, dense; trace of above anhydrite and dolomite.
5880 5920 Core No. 5, recovered 40'.
5920 5930 Limestone: dark gray, dense.

SERVICE & TESTING



WORKOVER HISTORY NO. 1



WELL LEASE AND NUMBER: East Poplar Unit Well No. 74
FIELD: East Poplar Unit COUNTY: Roosevelt STATE: Montana
WELL LOCATION: SE SW Section 13, T28N, R51E

STATUS PRIOR TO PRESENT JOB:

Date Completed: May 12, 1956 Date of Last Workover: None

T.D. : 5930' PBTD: 5576' Producing Zone: A- Zone of Madison Formation

Perforations: 5597'-5604' Cumulative Production of Present Zone: 55,708 BO,

346,746 BW Latest Test: December 12, 1963 - Pumping 398 BFPD, 93% water,

3 BOPD, 390 BWPD

JUSTIFICATION FOR WORKOVER: Squeeze the A- Zone and sand notch the A- Zone.

SUMMARY OF WORKOVER:

- 1-06-64 PBTD 5730' - Moved in and rigged up pulling unit. Pulled rods and tubing out of hole. Ran Baker Seal Assembly without latch on on 2-3/8" workover tubing string. Hydro tested tubing in hole to 5500#. No leaks. Tag Baker Model "D" Production Packer at 5578'. Closed well in overnight.
- 1-07-64 PBTD 5576' - Squeezed A-3 perforations 5597' to 5604' with 40 sacks of latex cement 2/10 of 1 % H-R4 retarder added. Stung into Baker Model "D" Production Packer at 5578'. Pressured csg. to 1500#, broke formation with 3100# at the rate of 3 BPM. Pulled out of Model "D" Packer. Mixed 11 bbls. of cement slurry displaced down tubing with 5 bbls. of fresh water ahead and 5 bbls. behind. Stung into packer, pressured casing to 1500#. Maximum squeeze pressure 3600# with 32 sacks in formation. Pulled out of packer reversed out 6 sacks cement to pit. Tested squeeze job and casing to 1200#, held ok. Pulled out of hole. Ran HOWCO Hydro Jet and collar locator. Closed well in overnight.
- 1-08-64 PBTD 5576' - Pressured casing and squeeze job to 1500#, held ok. Notched A- Zone with HOWCO Hydro Jet sub at 5567' & 5569' with 4000 gal. of salt water with 1# sand per gal. followed with 1000 gal. 7 1/2% retarded acid with 1# 20/40 sand per gal. Worked tubing 45° turn while cutting notch. Washed acid over notches six times and reversed out with 400 bbls. of salt water. Pump rate first 34 min. 5000# at 2 1/2 BPM. (Broke suction flange on Halliburton pump. Pumping with one pump last 6 min. 3200# at 2 1/2 BPM). Pulled out of hole laying down 2-3/8" tbg. Ran prod. string tubing in hole. Closed well in overnight.

SUMMARY OF WORKOVER CONTINUED:

- 1-09-64 PBTD 5576' - Ran rods and 2" x 1 1/4" x 16' insert pump. Started well pumping 11:00 A.M. 1-09-64.
- 1-10-64 PBTD 5576' - Pumping on 34" x 13 SPM. Well pumping off. Shot fluid level, indicated fluid at pump. Put 25 bbls. salt water down casing with hot oil truck. Well started pumping indicating down hole equipment was ok.
- 1-11-64 PBTD 5576' - Moved in pulling unit and rigged up. Ran Baker Model "R" Packer on 2-3/8" tubing with 121' of tail pipe. Tag bottom, spaced out tubing. Put on B.O.P. Closed well in overnight.
- 1-14-64 PBTD 5576' - Acidized A- Zone, sand notched at 5567' & 5569' with 500 gal. of 15% retarded acid. Circulated hole with salt water. Spotted acid on formation. Set Model "R" Packer at 5493' tail pipe at 5573'. Pressured casing to 1200#, pressured tubing to 2000#, bled down 300# in 5 minutes. Pressured to 2200#, bled 500# in 5 minutes. Pressure to 2500#, bled 700# in 5 minutes. Pressured to 3000#, bled 1200# in 5 minutes. Pressure to 3200#, bled 1400# in 5 minutes. Pressured to 3250#, broke back to 2700# injecting at the rate of 1/3 BPM. Pumped 11 bbls. in formation at 2800#, 1/3 BPM. Shut down pump. Bled to 2200# in 7 minutes. Released pressure, swabbed acid to pit, switch to test tank. Swabbed at the rate of 232 BFPD, water cut 10%, 209 BOPD, 23 BFPD. Released packer. Pulling out of hole laying down 2-3/8" tubing. Closed well in overnight.
- 1-15-64 PBTD 5576' - Finished laying down 2-3/8" tubing. Pulling unit down with motor starter out.
- 1-16-64 PBTD 5576' - Ran tubing and rods in hole with 2" x 1 1/4" x 16' insert pump. Started well pumping on 64" x 13 SPM at 11:00 AM 1-16-64.
- 1-17-64 PBTD 5576' - Pumping at the rate of 29 BFPD, 4% water, 28 BOPD, 1 BFPD.
- 1-18-64 PBTD 5576' - Pumping at the rate of 20 BFPD, .3 of 1% water, 20 BOPD, water .16.
- 1-19-64 PBTD 5576' - Pumping at the rate of 21 BFPD, 1% water, 20 BOPD, .21 water.
- 1-20-64 PBTD 5576' - Pumping at the rate of 17 BFPD, .8 water 16.69 BOPD, .13 BFPD.
- 1-21-64 PBTD 5576' - Pumping at the rate of 15 BFPD, .8 BSAW, 15 BOPD, .02 BFPD. This is the A- Zone initial potential. TO DROP FROM REPORT.

| DATE | ZONE | BFPD | W/C | BOPD | BWPD |
|---------|------|------|-----|------|------|
| 1-25-64 | A- | 46 | 28 | 33 | 13 |
| 1-26-64 | A- | 39 | 20 | 31 | 8 |
| 1-27-64 | A- | 36 | 22 | 28 | 8 |
| 1-28-64 | A- | 36 | 32 | 25 | 11 |
| 2-01-64 | A- | 30 | 54 | 14 | 16 |

RECAP OF WORKOVER:

1. Final Perforations: 5567' - 5569'
2. Final PBTD: 5576'
3. Last test after workover: 30 BFPD, 54% water, (14 BOPD, 16 BWPD)
4. Geologic Name of Producing Zone: A- Zone of Madison Formation

TUBING RECORD:

| | |
|---------------------------|----------------|
| RKE | 8.50 |
| 104 Jts. 2-7/8" 650# tbg. | 3223.96 |
| 1 2-7/8" Seating Nipple | 1.10 |
| 1 Jt. 2-7/8" 650# tbg. | 31.29 |
| 75 Jts. 2-3/8" 470# tbg. | 2258.62 |
| 1 2-3/8" Seating Nipple | 1.10 |
| 1 2-3/8" Perf. Nipple | 3.10 |
| 1 Jt. 2-3/8" 470# tbg. | 31.80 |
| 1 Howco tbg. anchor. | 2.40 |
| | <u>5561.87</u> |

ROD RECORD:

| | |
|-------------------|-------|
| 34 7/8" scrappers | 850' |
| 20 7/8" plain | 500' |
| 75 3/4" plain | 1875' |
| 90 5/8" plain | 2250' |
| Subs | 22 |
| | 5499 |

PUMP DATA:

2" x 1-1/4 x 16' insert pump T.H.D.

ZONE CHANGE RESULTS:

| DATE | ZONE | BFPD | W/C | BOPD | BWPD |
|----------|------|-----------|-----------|-----------|-----------|
| 12-02-63 | A- | 398 | 98 | 8 | 390 |
| 2-01-64 | A- | <u>30</u> | <u>54</u> | <u>14</u> | <u>16</u> |
| | | -368 | -44 | + 6 | -374 |

WORKOVER HISTORY NO. 2

August 18, 1964

Well Lease and Number: East Poplar Unit Well No. 74

Field: East Poplar Unit County: Roosevelt State: Montana

Well Location: SE SW Section 13, T28N, R51E

STATUS PRIOR TO PRESENT JOB:

Date Completed: May 12, 1956 Date of Last Workover: January 6, 1964

TD : 5930' PBTD: 5576' Producing Zone: A- Zone of Madison Formation

Perforations: 5567-5569'

Cumulative Production of Present Zone: 2,054 BO, 6,984 BW

Latest Test: August 5, 1964 - Pumping 15 BFPD, 68% water (5 BOPD, 10 BWPD)

JUSTIFICATION FOR WORKOVER: To increase production

SUMMARY OF WORKOVER:

8-18-64 PBTD 5576' - Pull tbg. and rods. Ran 2-1/2" W.O. tbg. string with Model "R" Packer. Circulated hole with oil set Model "R" Packer at 5555'. Acidized A- Zone perf. 5567-69' with 15 BO ahead 3000 gal. HOWCO CRA-10 acid followed with 15 BO. Formation started taking fluid at 2500# PSI, increased to 3500# PSI at end of acid job at maximum injection rate of 1/2 BPM. 5 min. bleed down 3200#. Shut in overnight.

8-19-64 PBTD 5576' - Swabbed tubing displacement and spent acid. Layed down W.O. tubing.

8-20-64 PBTD 5576' - Pumping load oil. Ran tubing and rods. Started pumping.

8-21-64 PBTD 5576' - Pumping load oil.

8-22-64 PBTD 5576' - Pumping all load oil recovered. Pumping at the rate of 50 BFPD, 44% water, 29 BOPD, 22 BWPD.

8-23-64 PBTD 5576' - Pumping at the rate of 52 BFPD, 48% water, 27 BOPD, 25 BWPD.

SUMMARY OF WORKOVER CONTINUED:

8-24-64 PBTD 5576' - Pumping at the rate of 47 BFPD,
54% water, 21 BOPD, 26 BWPD.

8-25-64 PBTD 5576' - Pumping at the rate of 44 BFPD,
60% water, 17 BOPD, 27 BWPD. TO TEMP. DROP
FROM REPORT UNTIL WELL LEVELS OFF.

8-31-64 PBTD 5576' - Pumping at the rate of 35 BFPD,
56% water, 15 BOPD, 20 BWPD. This is the
workover potential. TO DROP FROM REPORT.

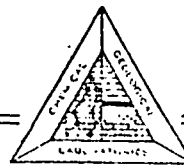
WORKOVER RESULTS:

| <u>DATE</u> | <u>ZONE</u> | <u>BFPD</u> | <u>W/C</u> | <u>BOPD</u> | <u>BWPD</u> | <u>REMARKS</u> |
|-------------|-------------|-------------|------------|-------------|-------------|-----------------|
| 8-05-64 | A- | 15 | 68 | 5 | 10 | Before acid job |
| 8-29-64 | A- | <u>35</u> | <u>56</u> | <u>15</u> | <u>20</u> | After acid job |
| | | 20 | (12) | 10 | 10 | |

RECAP OF WORKOVER:

1. Final Perforation: 5567'-5569' (unchanged)
2. Final PBTD: 5576'
3. Test after Workover: 35 BFPD, 56% water
15 BOPD, 20 BWPD
4. Geologic Name of Producing Zone: A- Zone of
Madison Formation

CHEMICAL & GEOLOGICAL LABORATORIES
OF MONTANA



CHEMISTS GEOLOGISTS ENGINEERS

113 WEST BELL
GLENDALE, MONTANA

June 25, 1956

Murphy Corporation
El Dorado, Arkansas

Re: Core Analysis Report
No. 74 Unit
East Poplar, Montana

Gentlemen:

Study of our attached core analysis of the four zones tested in the Murphy Corporation, Unit No. 74 Well indicates:

That "A" Zone will probably produce both oil and water; however, recoveries will not be large because of the low average porosity of only 5.4%. The lower portion of "A" Zone appears to be less oil productive than the upper.

That "B" Zone appears oil productive, moreso than "A" Zone due to the considerably higher oil saturations even though "B" Zone is less permeable. The porosity is good and the water saturations normal.

That "B-1" Zone will probably be water productive.

That "C" Zone appears to be oil productive but will probably need acidizing to increase the low permeability. The porosity in this zone is the best of the zones tested.

Very truly yours,

CHEMICAL & GEOLOGICAL LABORATORIES

C. E. Davis

By:

Louis F. Neuburger

CHEMICAL & GEOLOGICAL LABORATORIES of MONTANA

113 WEST BELL P. O. BOX 537
GLEN DIVE, MONTANA

CORE ANALYSIS REPORT

A Zone

Field East Poplar, Montana Well No. #74 Unit
Operator Murphy Corporation Laboratory No. 560

SUMMARY OF REPORT

DISTRIBUTION BY MAXIMUM PERMEABILITY RANGES

| PERMEABILITY RANGE | FOOTAGE | PERMEABILITY | POROSITY | WATER SATURATION | RESIDUAL OIL SATURATION |
|--------------------|-----------|--------------|------------|------------------|-------------------------|
| Less than 0.01 | | | | | |
| 0.01 - 0.09 | | | | | |
| 0.10 - 0.99 | <u>3</u> | <u>0.51</u> | <u>2.6</u> | <u>48.1</u> | <u>5.8</u> |
| 1.00 - 9.9 | <u>9</u> | <u>3.58</u> | <u>5.2</u> | <u>66.8</u> | <u>0.8</u> |
| 10 - 99 | <u>3</u> | <u>41.3</u> | <u>9.1</u> | <u>42.6</u> | <u>7.6</u> |
| 100 - 999 | | | | | |
| 1,000 + | | | | | |
| Total summarized | <u>15</u> | | | | |
| Total analyzed | <u>15</u> | | | | |
| 0.01 + | | | | | |
| 0.10 + | <u>15</u> | <u>10.5</u> | <u>5.4</u> | <u>58.2</u> | <u>3.1</u> |
| 1.00 + | <u>12</u> | <u>13.0</u> | <u>6.1</u> | <u>60.7</u> | <u>2.5</u> |
| 10 + | <u>3</u> | <u>41.3</u> | <u>9.1</u> | <u>42.6</u> | <u>7.6</u> |
| 100 + | | | | | |
| 1,000 + | | | | | |

Total porosity-feet 81.6
Total millidarcy-feet of 0.1 md. and above 158
Mean matrix density 2.69

Remarks: _____

CHEMICAL & GEOLOGICAL LABORATORIES of MONTANA

113 WEST BELL

P. O. BOX 537

GLENDALE, MONTANA

CORE ANALYSIS REPORT

B-1 Zone

Field East Poplar, Montana Well No. #74 UnitOperator Murphy Corporation Laboratory No. 560SUMMARY OF REPORTDISTRIBUTION BY MAXIMUM PERMEABILITY RANGES

| PERMEABILITY RANGE | FOOTAGE | PERMEABILITY | POROSITY | WATER SATURATION | RESIDUAL OIL SATURATION |
|--------------------|------------|--------------|-------------|------------------|-------------------------|
| Less than 0.01 | | | | | |
| 0.01 - 0.09 | | | | | |
| 0.10 - 0.99 | <u>0.5</u> | <u>0.75</u> | <u>10.5</u> | <u>32.5</u> | <u>5.9</u> |
| 1.00 - 9.9 | <u>6</u> | <u>3.87</u> | <u>12.3</u> | <u>47.1</u> | <u>15.6</u> |
| 10 - 99 | <u>1</u> | <u>18</u> | <u>15.3</u> | <u>29.3</u> | <u>27.0</u> |
| 100 - 999 | | | | | |
| 1,000 + | | | | | |
| Total summarized | <u>7.5</u> | | | | |
| Total analyzed | <u>7.5</u> | | | | |
| 0.01 + | | | | | |
| 0.10 + | <u>7.5</u> | <u>5.20</u> | <u>11.8</u> | <u>41.1</u> | <u>15.5</u> |
| 1.00 + | <u>7</u> | <u>5.89</u> | <u>12.7</u> | <u>44.6</u> | <u>17.2</u> |
| 10 + | <u>1</u> | <u>18</u> | <u>15.3</u> | <u>29.3</u> | <u>27.0</u> |
| 100 + | | | | | |
| 1,000 + | | | | | |

Total porosity-feet 94.4Total millidarcy-feet of 0.1 md. and above 11.6Mean matrix density 2.67

Remarks: _____

CHEMICAL & GEOLOGICAL LABORATORIES of MONTANA

113 WEST BELL

P. O. BOX 537

GLENDAVE, MONTANA

CORE ANALYSIS REPORT

B-2 Zone

Field East Poplar, Montana

Well No. #74 Unit

Operator Murphy Corporation

Laboratory No. 560

SUMMARY OF REPORT

DISTRIBUTION BY MAXIMUM PERMEABILITY RANGES

| PERMEABILITY RANGE | FOOTAGE | PERMEABILITY | POROSITY | WATER SATURATION | RESIDUAL OIL SATURATION |
|--------------------|-----------|--------------|-------------|------------------|-------------------------|
| Less than 0.01 | | | | | |
| 0.01 - 0.09 | | | | | |
| 0.10 - 0.99 | <u>3</u> | <u>0.64</u> | <u>7.8</u> | <u>65.0</u> | <u>0.0</u> |
| 1.00 - 9.9 | <u>11</u> | <u>2.17</u> | <u>10.3</u> | <u>57.3</u> | <u>4.5</u> |
| 10 - 99 | | | | | |
| 100 - 999 | | | | | |
| 1,000 + | | | | | |
| Total summarized | <u>14</u> | | | | |
| Total analyzed | <u>14</u> | | | | |
| 0.01 + | | | | | |
| 0.10 + | <u>14</u> | <u>1.84</u> | <u>9.8</u> | <u>59.0</u> | <u>3.5</u> |
| 1.00 + | <u>11</u> | <u>2.17</u> | <u>10.3</u> | <u>57.3</u> | <u>4.5</u> |
| 10 + | | | | | |
| 100 + | | | | | |
| 1,000 + | | | | | |

Total porosity-feet

137

Total millidarcy-feet of 0.1 md. and above

1.84

Mean matrix density

2.67

Remarks:

CHEMICAL & GEOLOGICAL LABORATORIES of MONTANA

113 WEST BELL P. O. BOX 537
GLENDAVE, MONTANA

CORE ANALYSIS REPORT

C Zone

Field East Poplar, Montana Well No. #74 Unit

Operator Murphy Corporation Laboratory No. 560

SUMMARY OF REPORT

DISTRIBUTION BY MAXIMUM PERMEABILITY RANGES

| PERMEABILITY RANGE | FOOTAGE | PERMEABILITY | POROSITY | WATER SATURATION | RESIDUAL OIL SATURATION |
|--------------------|-----------|--------------|-------------|------------------|-------------------------|
| Less than 0.01 | | | | | |
| 0.01 - 0.09 | | | | | |
| 0.10 - 0.99 | <u>3</u> | <u>0.46</u> | <u>13.7</u> | <u>31.5</u> | <u>40.3</u> |
| 1.00 - 9.9 | <u>3</u> | <u>2.23</u> | <u>17.4</u> | <u>30.9</u> | <u>20.3</u> |
| 10 - 99 | | | | | |
| 100 - 999 | | | | | |
| 1,000 + | <u>4</u> | <u>5000+</u> | <u>17.2</u> | <u>41.0</u> | <u>27.0</u> |
| Total summarized | <u>10</u> | | | | |
| Total analyzed | <u>10</u> | | | | |
| 0.01 + | | | | | |
| 0.10 + | <u>10</u> | <u>2001</u> | <u>16.2</u> | <u>35.1</u> | <u>29.0</u> |
| 1.00 + | <u>7</u> | <u>2858</u> | <u>17.3</u> | <u>36.7</u> | <u>24.1</u> |
| 10 + | <u>4</u> | <u>5000+</u> | <u>17.2</u> | <u>41.0</u> | <u>27.0</u> |
| 100 + | <u>4</u> | <u>5000+</u> | <u>17.2</u> | <u>41.0</u> | <u>27.0</u> |
| 1,000 + | <u>4</u> | <u>5000+</u> | <u>17.2</u> | <u>41.0</u> | <u>27.0</u> |

Total porosity-feet 162

Total millidarcy-feet of 0.1 md. and above 20,008

Mean matrix density 2.74

Remarks: _____

CHEMICAL & GEOLOGICAL LABORATORIES
OF MONTANA
113 West Bell
Glendive, Montana

CORE SUMMARY AND ESTIMATED RECOVERABLE OIL

CORE SUMMARY

| Formation Name | "A" Zone | "B1" Zone | "B2" Zone | "C" Zone |
|---|------------------|-------------|-----------|------------------------------------|
| Depth—Feet | 5597 - 5624 | 5738 - 47.5 | 5756 - 70 | 5899 - 5909 |
| Feet of Permeable Productive Formation | 15 | 7.5 | 14 | 10 |
| Porosity | Minimum | 0.4 | 7.2 | 3.4 |
| | Maximum | 15.8 | 15.6 | 15.3 |
| | Weighted Average | 5.4 | 11.8 | 9.8 |
| Permeability | Minimum | 0.1 | 0.5 | 0.5 |
| | Maximum | 69.0 | 18.0 | 4.2 |
| | Weighted Average | 10.5 | 5.2 | 1.8 |
| Capacity—Average Porosity x Feet Productive Formation | 81.0 | 88.5 | 137.2 | 162.0 |
| Weighted Average Residual Oil Saturation, % Pore Space | 3.1 | 15.5 | 3.5 | 29.0 |
| Weighted Average Total Water Saturation, % Pore Space | 58.2 | 41.1 | 59.0 | 35.1 |
| Weighted Average Connate Water Saturation, % Pore Space | 30.0 est. | 32.0 est. | 35.0 est. | 39.0 est. |
| Formation Volume Factor | 1.26 est. | 1.26 est. | 1.26 est. | 1.26 est. |
| Probable Type of Production | Oil & Water | Oil | Water | Oil |
| Remarks: | | | | Vertical Permeability 0.2 to 5000+ |

ESTIMATED RECOVERABLE OIL

| | | | |
|--------------------------------------|------|------|------|
| Stock Tank Oil in Place: | | | |
| Barrels Space per Acre-Foot | 419 | 915 | 1257 |
| Barrels Connate Water per Acre-Foot | 126 | 293 | 490 |
| Barrels Reservoir Oil per Acre-Foot | 293 | 622 | 767 |
| Barrels Stock Tank Oil per Acre-Foot | 233 | 494 | 609 |
| Solution Gas Drive: | | | |
| Barrels per Acre-Foot | | | |
| Barrels per Acre | | | |
| Water Drive: | | | |
| Barrels per Acre-Foot | 90 | 200 | 213 |
| Barrels per Acre | 1350 | 1500 | 2130 |

The interpretation and estimates herein are based upon information obtained from analyses of cores and/or material supplied by customer, and Chemical & Geological Laboratories assumes no responsibility nor makes no guarantee, as to the capacity of this well to produce oil and/or gas. The opinions and estimates contained herein represent the best judgment of Chemical & Geological Laboratories.

CHEMICAL & GEOLOGICAL LABORATORIES of MONTANA

113 WEST BELL

P. O. BOX 537

GLEN DIVE, MONTANA

FULL DIAMETER CORE STUDY

Operator Murphy Corporation Field East Poplar, Montana Formation A Zone & B-1 & B-2 Zone
Well No. #74 Unit Location C NW SW 13-28N-51E Depths 5595-5746.5
Elevation 2172 KB Date May 4, 1956 Lab. No. 560

| SAMPLE NO. | REPRESENTATIVE OF FEET | MIDPOINT OF SAMPLE | FOOTAGE | PERMEABILITY | | EFFECTIVE POROSITY % | DENSITY | | SATURATION % OF PORE SPACE | | DESCRIPTION |
|------------|------------------------|--------------------|----------|--------------|----------------|----------------------|---------|--------|----------------------------|-------|--------------|
| | | | | RADIAL | VERTICAL | | BULK | MATRIX | RESIDUAL OIL | WATER | |
| NS | CORE #2 | 5595-5625 | | | A Zone | | | | | | |
| 1 | 5595-97 | | | 35 | 3.87 | 4.6 | 2.53 | 2.66 | 5.4 | 40.0 | ls, VC |
| 2 | 97-98 | | | U.T. | 0.96 | 1.4 | 2.63 | 2.66 | 0.0 | 15.7 | ls, VC |
| 3 | 98-99 | | | U.T. | 4.42 | 2.0 | 2.62 | 2.67 | 5.5 | 70.5 | ls, VC |
| 4 | 5599-5600 | | | U.T. | 1.35 | 1.1 | 2.64 | 2.67 | Tr. | 61.8 | ls, VC, Pyr |
| 5 | 5600-01 | | | 4.63 | 0.92 | 0.4 | 2.67 | 2.68 | 0.0 | 95.0 | ls, Pyr |
| 6 | 01-02 | | | 0.82 | 1.23 | 1.6 | 2.65 | 2.69 | 0.0 | 26.3 | ls, VC, Pyr |
| NS | 02-03 | | | | | | | | | | |
| 7 | 03-14 | | | 2.94 | U.T. | 5.6 | 2.56 | 2.72 | 0.0 | 27.5 | ls, VC |
| NS | 14-15 | | | | | | | | | | |
| 8 | 15-16 | | | U.T. | 0.16 | 4.8 | 2.59 | 2.72 | Tr. | 44.2 | ls, H&VC, SP |
| 9 | 16-17 | | | 2.81 | 0.43 | 5.9 | 2.54 | 2.70 | Tr. | 78.4 | ls, SVu, I |
| 10 | 17-18 | | | 1.01 | 0.09 | 9.0 | 2.44 | 2.69 | Tr. | 90.8 | ls, I |
| 11 | 18-19 | | | 0.10 | 0.40 | 1.7 | 2.62 | 2.67 | 3.4 | 84.4 | ls, VC |
| 12 | 19-20 | | | 20 | 0.69 | 6.9 | 2.56 | 2.75 | 0.0 | 57.1 | ls, VC, I |
| 13 | 20-21 | | | 8.89 | 2.14 | 9.1 | 2.44 | 2.69 | 1.3 | 79.7 | ls, I |
| 14 | 21-22 | | | 69 | 35 | 15.8 | 2.27 | 2.69 | 17.3 | 30.6 | ls, VC, I |
| 15 | 22-23 | | | 4.94 | 1.54 | 11.7 | 2.38 | 2.69 | 0.0 | 70.8 | ls, I |
| | 23-24 | | | | | | | | | | |
| NS | CORE #4 | 5732-72 | Rec. 40' | | B-1 & B-2 Zone | | | | | | |
| 16 | 5732-38 | | | | | | | | | | Anhy |
| 17 | 38-39 | | | 1.17 | 1.44 | 11.2 | 2.38 | 2.68 | 11.8 | 63.7 | ls, I |
| 18 | 39-40 | | | 3.28 | 1.41 | 15.1 | 2.26 | 2.66 | 13.9 | 48.9 | ls, I |
| 19 | 40-40.5 | | | 0.75 | 0.31 | 10.5 | 2.38 | 2.66 | 5.9 | 32.5 | ls, I |
| NS | 40.5-42.5 | | | | | | | | | | Dense |
| 20 | 42.5-43.5 | | | 1.20 | 0.93 | 7.2 | 2.48 | 2.67 | 7.1 | 57.5 | ls, I |
| 21 | 43.5-44.5 | | | 3.38 | 2.11 | 11.7 | 2.34 | 2.65 | 11.5 | 35.8 | ls, I |
| 22 | 44.5-45.5 | | | 9.30 | 5.69 | 15.6 | 2.23 | 2.64 | 24.2 | 28.7 | ls, I |
| 23 | 45.5-46.5 | | | 18 | 3.85 | 15.3 | 2.26 | 2.67 | 27.0 | 29.3 | ls, I |

CHEMICAL & GEOLOGICAL LABORATORIES of MONTANA

113 WEST BELL P. O. BOX 537.

GLENDALE, MONTANA

FULL DIAMETER CORE STUDY

Operator Murphy Corporation Field East Poplar, Montana Formation B-1 & B-2 Zone

Well No. #74 Unit Location C NW SW 13-28N-51E Depths 5746.5-

Elevation 2172 KB Date May 4, 1956 Lab. No. 560

| SAMPLE NO. | REPRESENTATIVE OF FEET | MIDPOINT OF SAMPLE | FOOTAGE | PERMEABILITY | | EFFECTIVE POROSITY % | DENSITY | | SATURATION % OF PORE SPACE | | DESCRIPTION |
|------------|------------------------|--------------------|---------|--------------|----------|----------------------|---------|--------|----------------------------|-------|---------------|
| | | | | RADIAL | VERTICAL | | BUCK | MATRIX | RESIDUAL OIL | WATER | |
| 23 | 5746.5-47.5 | | | 4.63 | 3.08 | 13.0 | 2.34 | 2.69 | 25.2 | 48.0 | ls, I |
| NS | 47.5-56 | | | | | | | | | | Anhy |
| 24 | 56-57 | | | 0.56 | 0.60 | 11.8 | 2.36 | 2.67 | Tr. | 68.6 | ls, I |
| 25 | 57-58 | | | 2.36 | 1.36 | 15.3 | 2.25 | 2.66 | 11.9 | 47.5 | ls, I |
| 26 | 58-59 | | | 1.31 | 0.61 | 10.4 | 2.41 | 2.69 | 9.1 | 85.2 | ls, I |
| 27 | 59-60 | | | 2.21 | 1.35 | 12.4 | 2.32 | 2.65 | 2.8 | 50.9 | ls, I |
| 28 | 60-61 | | | 1.32 | 1.13 | 7.4 | 2.50 | 2.70 | 0.0 | 37.0 | ls, SVu |
| 29 | 61-62 | | | 2.39 | 0.74 | 3.8 | 2.60 | 2.70 | Tr. | 75.4 | ls |
| 30 | 62-63 | | | 0.83 | 0.18 | 3.4 | 2.55 | 2.64 | Tr. | 82.3 | ls |
| 31 | 63-64 | | | U.T. | 1.41 | 4.4 | 2.57 | 2.68 | 0.0 | 79.1 | ls |
| 32 | 64-65 | | | 1.65 | 0.67 | 10.4 | 2.40 | 2.68 | Tr. | 56.5 | ls, I |
| 33 | 65-66 | | | 0.49 | 0.20 | 8.1 | 2.44 | 2.66 | Tr. | 44.2 | ls, VC, I |
| 34 | 66-67 | | | 1.96 | 1.28 | 12.1 | 2.37 | 2.69 | 3.4 | 35.7 | ls, I |
| 35 | 67-68 | | | 4.23 | 2.24 | 13.7 | 2.31 | 2.68 | 11.3 | 45.3 | ls, Sty, I |
| 36 | 68-69 | | | 2.88 | 2.85 | 10.7 | 2.37 | 2.65 | 4.0 | 80.1 | ls, I |
| 37 | 69-70 | | | 2.08 | 2.16 | 13.0 | 2.34 | 2.69 | 6.8 | 37.6 | ls, I |
| NS | CORE #5 | 5880-5920 | | | C Zone | | | | | | |
| 38 | 5880-99 | | | | | | | | | | |
| 39 | 5899-5900 | | | 0.10 | 5000+ | 11.1 | 2.43 | 2.73 | 41.9 | 57.3 | ls, VF, I, SP |
| 40 | 5900-01 | | | 0.34 | 5000+ | 18.9 | 2.27 | 2.80 | 21.1 | 36.6 | ls, VF, I, SP |
| 41 | 01-02 | | | 0.42 | 5000+ | 17.7 | 2.28 | 2.78 | 20.9 | 32.9 | ls, VF, I, SP |
| 42 | 02-03 | | | 1.76 | U.T. | 15.0 | 2.31 | 2.72 | 27.6 | 32.0 | ls, VC, I |
| 43 | 03-04 | | | 0.40 | 0.27 | 13.1 | 2.36 | 2.72 | 37.9 | 34.9 | ls, I |
| 44 | 04-05 | | | 0.72 | 0.51 | 15.0 | 2.31 | 2.71 | 37.3 | 28.1 | ls, I |
| 45 | 05-06 | | | 0.26 | 0.17 | 13.0 | 2.37 | 2.72 | 45.6 | 31.5 | ls, I |
| 46 | 06-07 | | | 2.00 | 5000+ | 21.2 | 2.19 | 2.77 | 24.1 | 37.3 | ls, VF, I, SP |
| 47 | 07-08 | | | 3.30 | U.T. | 21.0 | 2.17 | 2.75 | 17.6 | 41.4 | ls, VC, I |
| 48 | 08-09 | | | 0.75 | 1.63 | 16.1 | 2.29 | 2.72 | 15.7 | 19.2 | ls, I |

ls - Limestone

SVu - Slightly Vuggy

VF - Vertical Fracture

Anhy - Anhydrite

VC - Vertical Crack

SP - Small Plug

I - Intergranular

Sty - Stylolite

Pyr - Pyrite

YAPUNCICH-SANDERSON LABORATORIES

BILLINGS, MONTANA

P. O. BOX 593

5 & 9th N. 25th St.

WATER ANALYSIS REPORT

Lab. No. _____

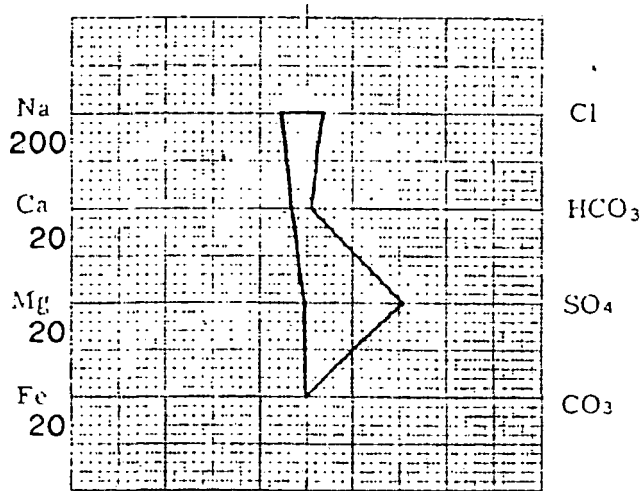
Field East Poplar County Roosevelt State Montana
 Well No. 74 Unit Location C NW SW 13-28N-51E
 Formation C Zone Depths 5891-5902'
 Operator Murphy Corporation Date Sampled 5-1-56
 DST No. 5 Sample Date Analyzed 6-1-56
 Other Data Tool open 4 hrs. SI 30 min. Recovered 540' gas, 5' oil, 105'
oil and gas cut mud and 45' muddy salt water. FP 15-35 lbs., SIP 2820
lbs., HP 3265 lbs. Sample quebracho colored water with mud on bottom.

| Constituents | PPM | MEQ. | MEQ. % | Total Solids in Parts per Million |
|------------------|---------------|--------|---------------------------------------|--------------------------------------|
| Sodium | 13,173 | 573.00 | 46.81 | By evaporation <u>39,230</u> |
| Calcium | 733 | 36.58 | 2.99 | After ignition <u>38,580</u> |
| Magnesium | 30 | 2.47 | 0.20 | Calculated <u>38,290</u> |
| Sulfate | 10,288 | 213.99 | 17.48 | pH <u>8.2</u> |
| Chloride | 13,790 | 388.88 | 31.77 | Specific Gravity @ 60°F <u>1.034</u> |
| Carbonate | Trace | Trace | Trace | Resistivity @ 68°F |
| Bicarbonate | 560 | 9.18 | 0.75 | ohms/meter <u>0.24</u> |
| Chloride as NaCl | <u>22,740</u> | PPM. | Total Solids From Resistivity as NaCl | <u>33,014</u> PPM. |

NOTE: Sodium and potassium reported as sodium. MEQ. milliequivalents per liter. PPM. parts per million (milligrams per liter). 1 PPM equivalent to 0.0001%.

WATER ANALYSIS PATTERN

Scale MEQ. Per Unit



YAPUNCICH-SANDERSON LABORATORIES

BILLINGS, MONTANA

P. O. BOX 593

5 & 9th N. 25th St.

WATER ANALYSIS REPORT

Lab. No. _____

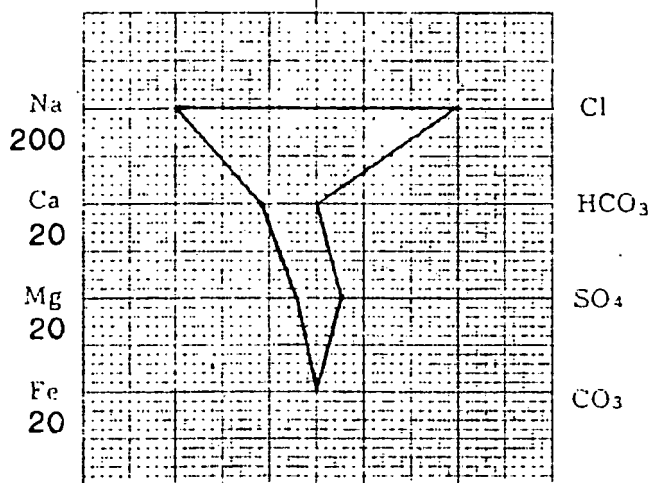
Field East Poplar County Roosevelt State Montana
 Well No. 74 Unit Location C NW SW 13-28N-51E
 Formation B-1 Zone Depths 5735-5748'
 Operator Murphy Corporation Date Sampled 4-30-56
 DST No. 4 Sample Date Analyzed 6-1-56
 Other Data Tool open 4 hrs. SI 30 min. Recovered 450' gas, 30' oil and
270' salt water with show of oil. FP 15-130 lbs., SIP 1992 lbs.,
HP 3200 lbs. Sample clear reddish colored water with mud on bottom.

| Constituents | PPM | MEQ. | MEQ. % | Total Solids in Parts per Million |
|------------------|----------------|---------|---------------------------------------|--------------------------------------|
| Sodium | 66,943 | 2911.84 | 47.46 | By evaporation <u>182,400</u> |
| Calcium | 2336 | 116.57 | 1.90 | After ignition <u>180,900</u> |
| Magnesium | 480 | 39.46 | 0.64 | Calculated <u>179,252</u> |
| Sulfate | 2765 | 57.51 | 0.94 | pH <u>6.4</u> |
| Chloride | 106,602 | 3006.18 | 48.99 | Specific Gravity @ 60°F <u>1.118</u> |
| Carbonate | 0 | 0 | 0 | Resistivity @ 68°F |
| Bicarbonate | 255 | 4.18 | 0.07 | ohms/meter ³ <u>0.059</u> |
| Chloride as NaCl | <u>175,787</u> | PPM. | Total Solids From Resistivity as NaCl | <u>0.059</u> PPM. |

NOTE: Sodium and potassium reported as sodium. MEQ - milliequivalents per liter. PPM - parts per million (milligrams per liter). 1 PPM equivalent to 0.0001%.

WATER ANALYSIS PATTERN

Scale MEQ. Per Unit



YAPUNO H SANDERSON LABORATORIES

BILLINGS, MONTANA

P. O. BOX 593

5 & 9 1/2 N. 25th St.

WATER ANALYSIS REPORT

Lab. No. 1092-W

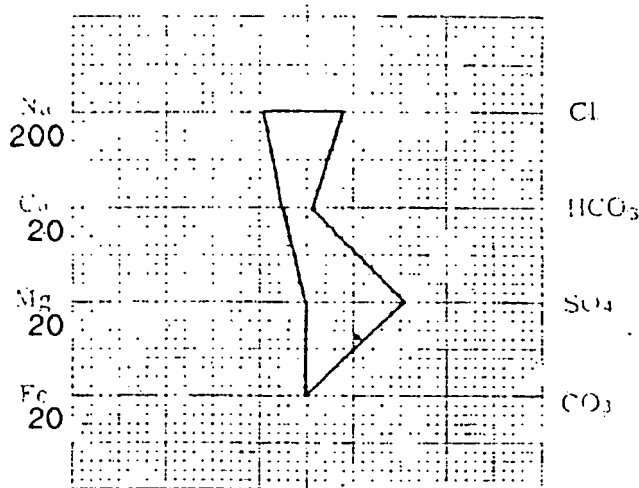
Field East Poplar Roosevelt State Montana
 Well No. 74 Unit C NW SW 13-28N-51E
 Formation A Zone Depth 5609-5625'
 Operator Murphy Corporation Date Sampled 4-27-56
 DST No. 2 Date Analyzed 6-1-56
 Other Data Tool open 1 hr. SI 15 min. Recovered 1820' gas, 180' oil, 60'
oil and gas cut mud and 630' salty sulfur water. FP 15-392 lbs., SIP
2818 lbs., HP 3330 lbs. Sample watery mud. Filtrate quebracho colored
water. Organic matter present.

| Constituents | PPM | MEQ. | MEQ. % | Total Solids in Parts per Million |
|------------------|--------|--------|---|--------------------------------------|
| Sodium | 22,140 | 963.02 | 47.19 | By evaporation <u>62,480</u> |
| Calcium | 990 | 49.40 | 2.42 | After ignition <u>61,900</u> |
| Magnesium | 96 | 7.89 | 0.39 | Calculated <u>61,948</u> |
| Sulfate | 9958 | 207.13 | 10.15 | pH <u>8.2</u> |
| Chloride | 28,362 | 799.81 | 39.19 | Specific Gravity @ 60°F <u>1.046</u> |
| Carbonate | Trace | Trace | Trace | Resistivity @ 68°F |
| Bicarbonate | 815 | 13.37 | 0.66 | ohms meter <u>0.15</u> |
| Chloride as NaCl | 46,769 | PPM | Total Solids from Resistivity as NaCl <u>56,834</u> | PPM. |

NOTE: Sodium and potassium are reported in MEQ. (milliequivalent) per liter. 1 PPM equivalent to 0.0001%.

WATER ANALYSIS PATTERN

Scale MEQ. Per Unit



YAPUNCICH-SANDERSON LABORATORIES

P. O. BOX 593

BILLINGS, MONTANA

5 & 9 1/2 N. 25th St.

WATER ANALYSIS REPORT

Lab. No. 1091-W

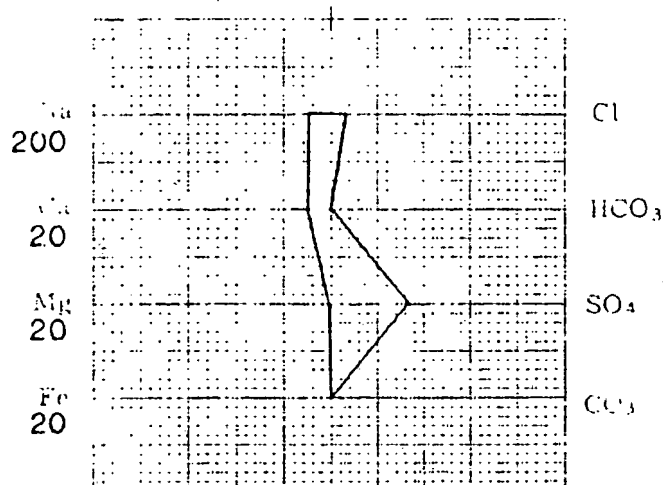
Field East Poplar County Roosevelt State Montana
 Well No. 74 Unit Location C NW SW 13-28N-51E
 Formation A Zone Depths 5598-5607'
 Operator Murphy Corporation Date Sampled 4-27-56
 DST No. 1 Sample Date Analyzed 6-1-56
 Other Data Tool open 4 hrs. SI 30 min. Recovered 1720' gas, 380' oil and 30' oil and gas cut mud. FP 15-130 lbs., SIP 2532 lbs., HP 3390 lbs. Sample reddish colored oily water with mud on bottom. Organic matter present.

| Constituents | PPM | MEQ. | MEQ. % | Total Solids in Parts per Million |
|------------------|---------------|--------|---|--------------------------------------|
| Sodium | 10,154 | 441.65 | 44.88 | By evaporation <u>32,580</u> |
| Calcium | 1010 | 50.40 | 5.12 | After ignition <u>31,700</u> |
| Magnesium | 0 | 0 | 0 | Calculated <u>30,746</u> |
| Sulfate | 8214 | 170.85 | 17.36 | pH <u>8.7</u> |
| Chloride | 11,247 | 317.17 | 32.23 | Specific Gravity @ 60°F <u>1.029</u> |
| Carbonate | 121 | 4.03 | 0.41 | Resistivity @ 68°F |
| Bicarbonate | 0 | 0 | 0 | ohms/meter <u>0.28</u> |
| Chloride as NaCl | <u>18,546</u> | PPM | Total Solids from Resistivity as NaCl <u>26,620</u> | PPM. |

NOTE: Sodium and potassium reported in meq. are not equivalent to the meq. of calcium, magnesium, and bicarbonate. 1 PPM equivalent to 0.0001%.

WATER ANALYSIS PATTERN

Scale MEQ. Per Unit



Location: C SE SW Sec. 13-T28N-R51E

Spacing - 160 acres

Elevation: 2173 K.B. - 2160 Gr.

Spudded: 4-10-56

Completed: 5-12-56

T.D.: 5930' Driller - 5930' Schl.

Prod. Zones: A-3 5597-5604

Schlumberger Tops

| | Depth | Datum | Thickness |
|--------------|--------|-------|-----------|
| Judith River | ---- | ----- | |
| Greenhorn | *2417 | - 244 | |
| Muddy Sd | 3213 | -1040 | |
| Dakota Silt | ---- | ----- | |
| Piper Ls | 4411 | -2238 | |
| Amsden | 4805 | -2632 | |
| Heath | 4923 | -2750 | |
| Otter | 5078 | -2905 | |
| Kibbey Sd | 5248 | -3075 | |
| Kibbey Ls | 5400 | -3227 | |
| Madison | 5496 | -3323 | |
| A-1 | **5567 | -3394 | 2' |
| A-2 | **5584 | -3411 | 5' |
| A-3 | 5599 | -3426 | 12' |
| A-4 | *5612 | -3439 | 23' |
| B-1 | **5742 | -3569 | 8' |
| B-2 | *5758 | -3585 | 16' |
| B-3 | 5781 | -3608 | 5' |
| B-4 | **5812 | -3639 | 4' |
| B-5 | 5847 | -3674 | ? |
| C-1 | **5880 | -3707 | ? |
| C-2 | **5904 | -3731 | 9' |

**Probable prod. Zones (From DST structural position, etc.)

*Shows

Drill Pipe Corrections (Made)

3505 Driller - 3518 SLM (+13')

Coring Intervals:

#1 5255-5296 Rec. 40' A-1 & 2

#2 5595-5625 Rec. 29' A-3 & 4

#3 5720-5732 Rec. 11' B-1

#4 5732-5772 Rec. 40' B-2

#5 5880-5920 Rec. 40' C-1 & 2

Drill Stem Tests:

DST #1 5598-5607' A-3 & 4. Hall. strad. pkr. Tool opn 4 hrs, SI 30 min. Opn w/fair blow, incrsd to med in 30 min. Rec. 1720' gas, 380' cln oil, 30' o & g cut mud, no wtr. IBHFP 15, FBHFP 130, BHSIP 2532, Hydro 3390.

DST #2 5609-5625' A-4 Hall single pkr test. Tool opn 1 hr, SI 15 min. Tool opn w/strng blow and remained thruout. Rec. 1820' gas, 180' cln oil, 60' o & g cut mud, 630' salt and sulf wtr. IBHFP 15 FBHFP 392 BHSIP 2818 Hydro 3330.

DST #3 5749-60 B-2. Strad test, tool opn 4 hrs, SI 30 min. Tool opnd w/weak blow, remained thruout test. Rec. 450' gas, 360' salt wtr w/tr oil. IBHFP 15, FBHFP 130, BHSIP 2660, Hydro 3170.

DST #4 5735-48' B-1 Hall strad pkr. Tool opn 4 hrs, SI 30 min. Tool opnd w/weak blow for 1st hr, incrsd to med blow for rest of test. Rec. 450' gas, 30' cln oil, 270' s.w. with show of oil. IBHFP 15, FBHFP 130 BHSIP 1992.

DST #5 5891-5902' C-2. Strad test. Tool opn 4 hrs, SI 30 min. Tool opnd w/weak blow, cont'd thruout. Rec. 540' gas, 5' cln oil, 105' o & g cut mud, 45' muddy s.w. IBHFP 15#, FBHFP 35#, BHSIP 2820#. Hydro 3265#.

History Subsequent to Completion:

None

SURFACE EQUIPMENT

PRODUCTION &
INJECTION DATA

- - -

PLUGGING &
ABANDONMENT